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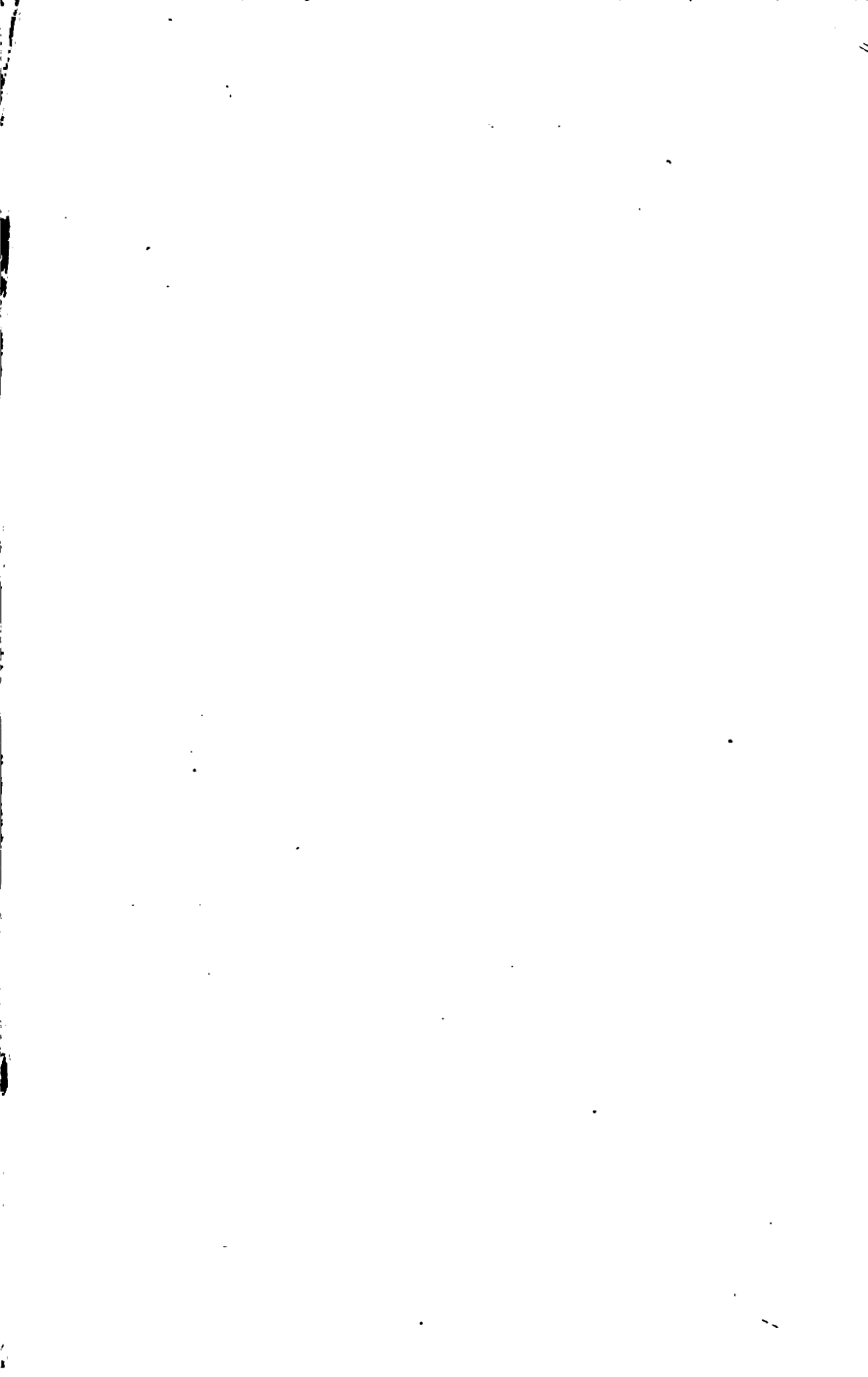
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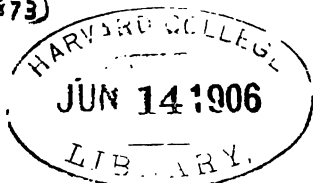
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## PREFACE.

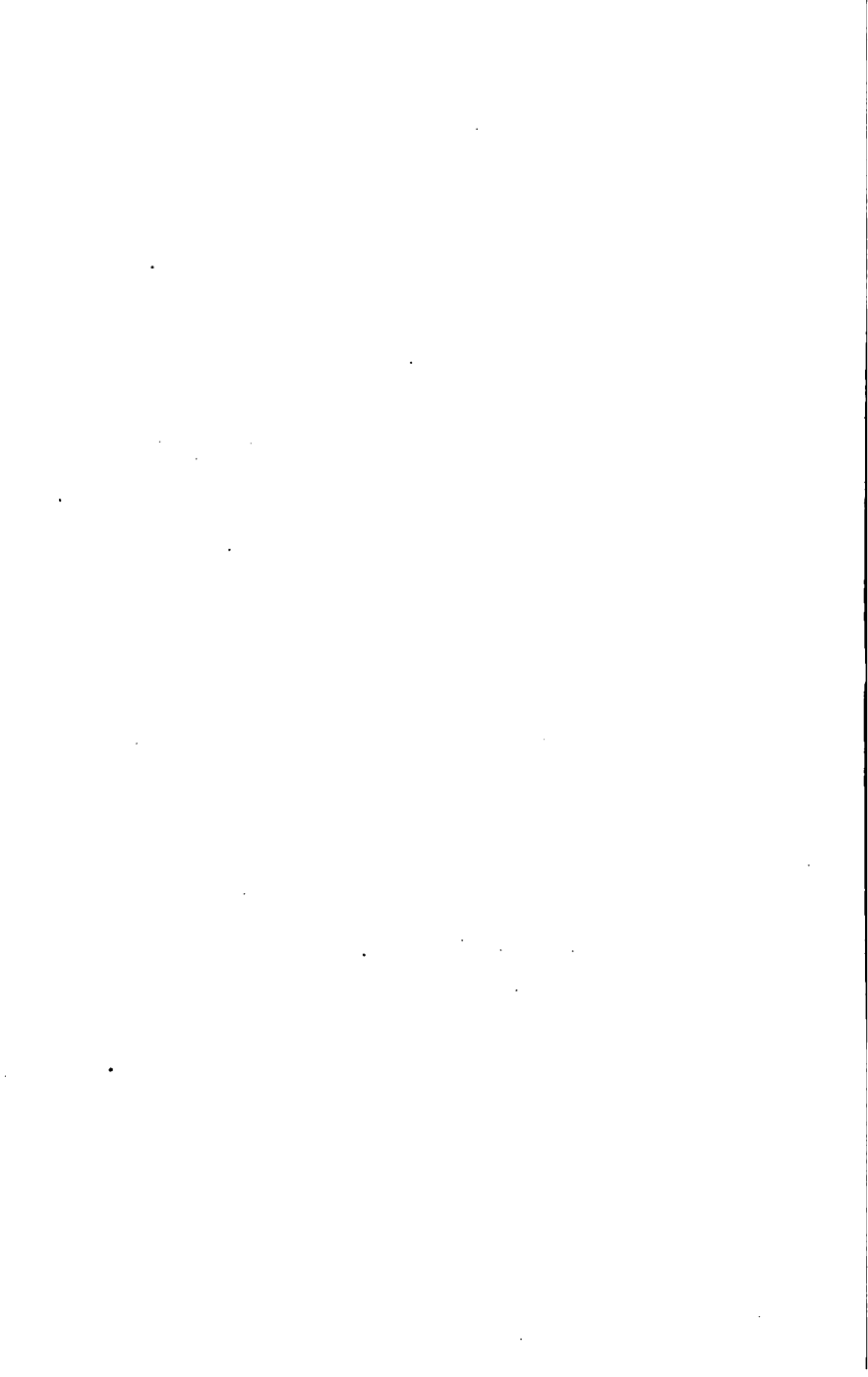
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THE following questions make a complete set of the Examination Papers (except on the subject of Geometry) which have been used for admission to Harvard College since 1860. No papers on Geometry are given previous to 1866, as the requisites for admission to that department were changed in that year. The papers on Trigonometry previous to 1871 are for examination for advanced standing; since then, for admission to Course II.

These papers will furnish an excellent series of questions on Modern, Physical, and Ancient Geography; Grecian and Roman History; Arithmetic and Algebra; Plane and Solid Geometry; Logarithms and Trigonometry; Latin and Greek Grammar and Composition; Physics and Mechanics. They have been collected and published in this form for the convenience of teachers and classes in high schools, and especially for pupils preparing for college.

The papers for admission used hereafter, at the annual examinations in June and September, will be added every year to this volume.

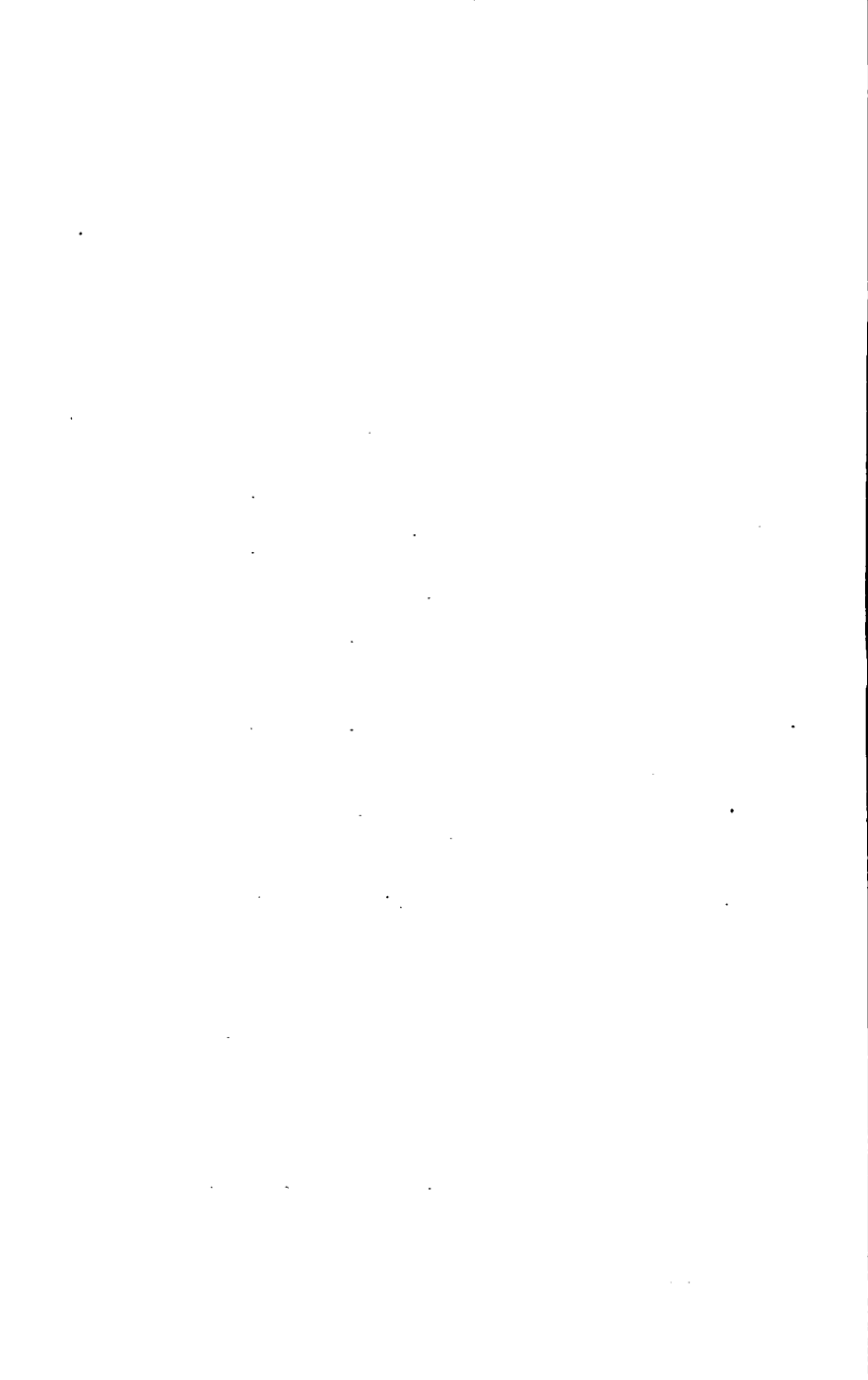
MELROSE, MASS., March, 1873.



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# EXAMINATION PAPERS.

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## HISTORY AND GEOGRAPHY.

### I.

1. MENTION the principal nations that flourished before the Greeks. 2. What was the extent of Greece as compared with the territories of those nations? 3. What were the earliest governments among the Greeks? Mention the other forms of government which were afterwards adopted. 4. Mention the principal periods in Grecian history. 5. Give some account of Lycurgus; of Solon. 6. Mention the principal events in the Persian wars; mention some of the most distinguished persons engaged in them. 7. What causes led to the Peloponnesian War? Mention the principal events; the principal persons; the duration; the result of this war. 8. State what you know of the condition of Greece in the period following the Peloponnesian War. 9. State what you know of the history of Thebes. 10. State briefly what you know of the relations between Macedonia and Greece in the time of Philip and Alexander. 11. When, and by whom, was Greece subjected to Rome? 12. Give some account of the foundation of Rome, and its first form of government. 13. What revolution put an end to the first government? and what government succeeded it? 14. Mention some of the early

Italian conquests of the Romans. 15. State some of the principal events in the Punic wars, and what was their conclusion. 16. State what you know of Catiline; at what period he lived; what political transactions he was engaged in; who were his most distinguished contemporaries; what became of him. 17. Give some account of the leaders in the Civil Wars. 18. Mention the circumstances of the death of Julius Cæsar. 19. What events followed his death? How, and by whom, were the civil conflicts composed?

## II.

1. Name the following persons in proper historical order, and mention something that is recorded of each: Codrus, Flaminius, Lysander, Mardonius, Marius, Pyrrhus, Regulus, Socrates, Themistocles. 2. State briefly the origin of the First Punic War. 3. Give some account of Pericles, and what he did for Athens. 4. What famous battles were fought in Bœotia? 5. Give some account of Hannibal. 6. Who was Cleopatra? 7. Describe the battle of Pharsalia? 8. Name the first six Cæsars. 9. What is meant by the Heroic Age?

## III.

1. Name the following persons in proper historical order, mentioning to what nation each belonged, and for what he was noted: Aristides, Cincinnatus, Draco, Epaminondas, Fabius, Pericles, Pompey, Solon, Sylla, Trajan. 2. Name the three persons whom you consider most noted in Grecian history; and state very briefly what each did. 3. Three in Roman history, in like manner. 4. What was the occasion of the First Persian War? 5. Describe the battle of Marathon; of Arbela. 6. Who were the kings of Rome? 7. State all you know of Jugurtha.

## IV.

1. Give an account of the first invasion of Greece by the Persians. Tell when it occurred, what was the cause of it, what forces were employed, both of ships and men, what generals were engaged, and every other particular you remember. 2. Describe the Second Punic War in the same way. 3. Name "the twelve Cæsars" in the order of their reigns. 4. In what year was Julius assassinated? 5. When did Constantine become emperor?

## V.

1. What were the principal countries known to the ancients? 2. Describe the situation of Palestine; of Phœnicia; of Egypt. 3. What were the principal divisions of Asia Minor? By whom was Asia Minor colonized? 4. Describe the situation of Greece; mention some of the most important mountains, rivers, plains, gulfs, seas. 5. Mention the principal divisions of Greece; give the names and situation of the most celebrated cities. 6. What countries were comprised in Greece proper? in Peloponnesus? What were the principal Greek islands? 7. Describe the situation of Italy. What countries were comprised in Italy proper? 8. Where was Rome? on what hills was it built? Mention some of the other principal cities of Italy; the principal islands. 9. Describe the Mediterranean Sea; its shape; its extent. Mention the principal ancient nations that inhabited its shores.

## VI.

1. Describe Sicily. 2. What were the principal cities of Greece? 3. What countries in Africa? 4. What rivers in Cisalpine Gaul? 5. Where was Illyricum? Arca-



dia ? the river Thermodon ? 6. Draw, on half a page, an outline map of Greece, Macedonia, Thrace, and Asia Minor, especially of their sea-coasts ; or, if you cannot draw, name the seas of the ancient world, and all the islands in each of them.

## VII.

1. Describe Egypt. 2. What were the principal cities of Asia Minor, and for what was each noted ? 3. What mountains in and around Thessaly ? What in Peloponnesus ? 4. Where was Colchis ? Mount Ararat ? the river Strymon ? Tyre ? 5. Draw an outline of the coasts of the Mediterranean and Adriatic Seas, with the principal islands ; and give the ancient names of the countries and rivers in the regions now occupied by Italy, Spain and Portugal, France, and Great Britain.

## VIII.

1. Where was Colchis ? 2. Name the countries of Greece proper. 3. What mountains in Bœotia ? 4. What was its capital ? 5. What other noted places in Bœotia ? 6. Draw a map about two inches in breadth representing the Peloponnesus, with the divisions and cities marked. 7. Describe Spain. 8. What was the former name of Saragossa ? 9. What river between Italy proper and Cisalpine Gaul ? 10. What Roman roads do you remember ?

## IX.

1. What mountain ranges enclose the Mississippi Valley ? Describe the Mississippi River and its tributaries, giving the source and direction of each. 2. Describe Chesapeake Bay and the rivers which run into it. 3. De-

scribe the Alps. Give the name, course, and exit of each of the great rivers which rise in them. 4. State the divisions, in the order of their situation, belonging to the Peloponnesus, with the position of five principal towns. 5. Give the history and geography of the battle of Marathon. 6. Who was (or were) victorious, and over whom, at (1) Salamis; (2) Plataea; (3) Mantinea; (4) Chæronea; (5) Arbela; (6) the Caudine Forks; (7) Zama; (8) Actium? 7. Name the principal events in the life of Julius Cæsar, and such dates as you can call to mind. 8. Name the Twelve Cæsars, so called. Also the Five Good Emperors, sometimes so called. 9. Themistocles. 10. Describe the administration and policy of Pericles. 11. Give an account of the Athenian expedition to Sicily.

## X.

1. Athens and Sparta; compare and contrast them. 2. The death of Socrates. 3. Give the position of the following places, and tell what has made them famous: (1) Marathon; (2) Salamis; (3) Plataea; (4) Mantinea; (5) Arbela; (6) Chæronea; (7) Pydna. 4. Who gained and who lost the battles fought at the following places: (1) Cannæ? (2) Zama? (3) Pharsalia? (4) Philippi? (5) Actium? 5. Greenwich is in longitude  $0^{\circ}$ , and in north latitude  $51\frac{1}{2}^{\circ}$ : what are the longitude and latitude of the spot on the earth's surface opposite, or antipodal, to Greenwich? 6. Describe or bound the basin of the Mississippi River. 7. The institutions of Lycurgus and the laws of Solon. 8. The chief ties which bound together the Grecian world. 9. Epaminondas. 10. Give the chief rivers of France, with their ancient names.

## XI.

1. Give the general course of (1) the Nile; (2) the Rhine; (3) the Danube; (4) the Elbe; (5) the Volga; (6) the St. Lawrence; (7) the Susquehanna; (8) the Amazon.

2. (1) What number of degrees represent the greatest possible latitude? (2) The greatest possible longitude? (3) Except at the equator, which is the greater, a degree of latitude or a degree of longitude? (4) Give, in degrees, the width of the torrid zone. (5) Which way from the north pole are London and New York? (6) What island near Africa is crossed by the Tropic of Capricorn?

3. Which of the Mediterranean islands preserve substantially their ancient names?

4. What are the modern names of (1) Lugdunum? (2) Massilia? (3) Eboracum? (4) Eubœa? (5) Corcyra? (6) the Sequana? (7) the Iberus? (8) the Padus?

5. (1) Plataea; (2) Sphacteria; (3) Syracuse; (4) Ægospotami: give the geographical situation of these places, and say (in a sentence or two for each) what occurred there in the Peloponnesian War.

6. Where, and over whom, did Alexander the Great gain his greatest victories, and what were the general results of his conquests?

7. Which took place first, (1) the fall of Carthage or the captivity of Jugurtha? (2) the battle of Actium or the battle of Philippi? (3) the death of Pompey or the death of Cæsar? (4) the death of Antony or the death of Cicero? (5) the fall of Corinth or the fall of Jerusalem?

8. Describe the city of Athens.

9. Contrast the empire, government, and policy of Athens with those of Sparta, giving such instances and illustrations as may occur to you.

## XII.

1. (1) What are the principal river basins of France?

(2) Give the general course of the rivers. (3) Through

what waters must you pass in going from London to Canton? 2. The latitude of Boston is about  $42^{\circ}$  N.; its longitude is about  $71^{\circ}$  W. (1) What city in Europe has nearly the same latitude? (2) and what are the latitude and longitude of the point opposite, or antipodal, to Boston? 3. Point out the principal divisions, rivers, and mountains of Ancient Italy, by means of an outline map, or not, as you please. 4. Where is (1) Mount Athos? (2) Thermopylæ? (3) Artemisium? (4) Salamis? (5) Platæa? (6) Mycale? With the geography of each place, mention some event connected with the history of the place. 5. Name the important battles in the Second Punic War. 6. Give a particular account of the legislation of Lycurgus, Solon, and Cleisthenes.

## XIII.

1. Which way from Athens to (1) Corinth; to (2) Marathon; to (3) Delos; to (4) Thermopylæ; to (5) the Hellespont; to (6) Crete: from Rome to (7) Carthage; to (8) Carthago Nova; to (9) Cannæ; to (10) Neapolis; to (11) Tarentum; to (12) Verona; to (13) Massilia; to (14) Lugdunum; to (15) the Baleares; to (16) Gades? 2. Three statesmen: (1) Themistocles; (2) Pericles; (3) Epaminondas. 3. The expedition of Cyrus the Younger, and the retreat of the Ten Thousand. 4. The chief events in the life of Julius Cæsar. 5. The rivers of Virginia, — describe them. 6. The principal English colonies; name and situation. 7. Give a brief account of the reforms of Cleisthenes. 8. The Persian invasions, and the principal battles in each, — a short sketch. 9. After these invasions the war languished for several years, until it was finally closed by the Peace of Cimon: what can you relate of the times of that peace? Compare the Peace of Cimon with that of Antalcidas, stating the time and circumstances of the lat-

ter. 10. Compare Athens and Sparta. What were the causes and results of the Peloponnesian War? 11. Give some account of Philip of Macedon and of Alexander, and compare the two. 12. The geographical position and configuration of Greece.

#### XIV.

1. Give a sketch of the life of Themistocles. 2. Describe the battle of Plataea. 3. Describe the administration of Pericles, and illustrate it by events. 4. Write an account of the Sicilian expedition. 5. Give the geographical position of Byzantium, Dyrrachium, Aquileia, Tarentum, Saguntum, Cannae, Massilia, Eboracum. 6. What is the difference between a parallel and a meridian? How far, in degrees, is each polar circle from its pole? What is the greatest possible latitude? longitude? 7. The basin of a river is the entire area or territory watered or drained by the river and all its branches: what European states lie, wholly or in part, in the basin of the Rhine, and what States of our Union are, wholly or in part, in the basin of the Mississippi? 8. Name a fact in the history of each of the following places, and give the situation of each: Marathon, Salamis, Plataea, Mantinea, Chæroneia, Arbela, Cannae, Syracuse, Zama, Pharsalia, Philippi, Actium. 9. What most notable service was rendered to his country by Leonidas, Thrasybulus, Marius, Demosthenes, Cicero?

#### XV.

1. Where were Corinth, Thessalonica, Philippi, Ephesus, Sardis? 2. Four important ancient battles: two from Grecian and two from Roman history. Name the victorious and the vanquished party, and show the importance of the battles. 3. The expedition of the Younger Cyrus against

Persia, and that of Alexander. 4. The position of the Alps and the Apennines ; the rivers that rise in them. 5. Any four English colonies ; the chief Spanish colony ; the great French dependency in Africa. To what power do the Azores belong ? 6. Where are Batavia, Van Diemen's Land, New Orleans, San Francisco ? What historical inferences do you draw from their names ? 7. The statesmanship of Themistocles. 8. The Athenian power at the beginning and at the end of the Peloponnesian War. 9. The Athenian and the Spartan polity, character, influence.

## XVI.

1. Give the latitude of the tropics and of the polar circles. What makes them good boundaries for zones ? Define *arctic* and *antarctic* according to their *derivation*. 2. The longitude of St. Petersburg is  $30^{\circ}$  east from Greenwich : give the longitude of two places, one  $120^{\circ}$  east, and the other  $120^{\circ}$  west, from St. Petersburg. 3. What is meant in geography by *watershed* and *basin* ? What is the relation of the Po to the Alps and Apennines, and of the Mississippi to the Rocky Mountains and Alleghanies ? 4. Point out four towns in this country named after foreign towns, and give the situation of the former and of the latter. 5. Candia : its situation and ancient name. Mont Blanc : in what country is it ? 6. Waterloo, Sebastopol, Gettysburg, Sadowa : where ? 7. Saguntum, the Trebia, Lake Trasimenus, Cannæ, Zama : geographically and historically. 8. The Rubicon, Pharsalia, Philippi, Actium : geographically and historically. 9. The Acropolis of Athens. 10. Where is Syracuse ? Give an account of the failure of the Athenian expedition to Sicily. 11. What revolutions took place in the government of Athens between 477 and 403. B. C. ? By whom were they effected ?

12. The character of Cimon. 13. Give the history of Plataea. 14. In what year of the Peloponnesian War was the battle of Amphipolis? What were its consequences? Who was the victor? Where was Amphipolis?

## XVII.

1. Themistocles, Pericles, Thrasybulus. What, *in brief*, did these men severally do for Athens, and when? 2. Give the situation of Marathon, Thermopylae, Salamis, Sphacteria, Syracuse, Aegospotami, Leuctra, Arbela; and tell who won and who lost there. 3. Give the position of the cities (or some of them) to which St. Paul's Epistles were directly sent. 4. With what seas are the mountains of Switzerland connected by rivers? 5. Which of the United States lie in the basin of the Mississippi River? 6. Name and place *three* of the highest mountains in the world. Knowing the height of a mountain in feet, with what divisor will you reduce the height to miles? 7. The sculptor Pheidias (Phidias). 8. The first meeting of the Peloponnesian Confederacy at Sparta (B. C. 432) just before the great war. 9. The Roman Comitia. 10. Julius Cæsar in Spain.

## XVIII.

1. Bound the *basin* of the Po, of the Mississippi, of the St. Lawrence. 2. Name the chief rivers of Ancient Gaul and Modern France. Is France larger or smaller than Transalpine Gaul? What are the two principal rivers that rise in the Alps? Where is Mont Blanc? 3. Where is the source of the Danube? of the Volga? of the Ganges? of the Amazon? 4. Describe the route of the Ten Thousand, or lay it down on a map. 5. Leonidas, Pausanias, Lysander. 6. Pharsalia, Philippi, Actium: geographically and histor-

ically. 7. Supply the two names left blank in the following passage from the Oration for the Manilian Law: "Non dicam duas urbes potentissimas, *Carthaginem* et *Numantiam* ab eodem ——— esse deletas; non commemorabo nuper ita vobis patribusque esse visum, ut in uno ——— spes imperii poneretur, ut idem cum *Jugurtha*, idem cum *Cimbris*, idem cum *Teutonis* bellum administraret." Who was Jugurtha? Where was Numantia? 8. Compare Athens with Sparta. 9. Pericles: the man and his policy.

## XIX.

1. From Cæsar: "Gallos ab Aquitanis *Garumna* flumen, a Belgis *Matrona* et *Sequana* dividit." "Aquitania a *Garumna* flumine ad *Pyrenæos* montes et eam partem *Oceani*, quæ est ad *Hispaniam*, pertinet." Translate these passages. Bound Aquitania, describing geographical positions (where names are in italics), and giving modern names. (You may, if you choose, substitute a map for the description.) 2. From Cæsar: "Undique loci natura Helvetii continentur; una ex parte flumine *Rheno*, qui agrum Helvetium a Germanis dividit; altera ex parte monte *Jura* altissimo, qui est inter Sequanos et Helvetios: tertia lacu *Lemanno* et flumine *Rhodano* qui *Provinciam* nostram ab Helvetiis dividit." Deal with this as with the preceding. 3. From Virgil:

- (1) "Quin Decios Drusosque procul, sævumque securi  
Adspice Torquatum, et referentem signa *Camillum*:"
- (2) "Quis te, magne Cato, tacitum, aut te, Cosse, relinquit?  
Quis *Gracchi* genus, aut *geminos*, duo fulmina belli,  
*Scipiadæ*, cladem Libyæ?"

Translate and explain. 4. Cicero enumerates the wars in which *Pompeius* had distinguished himself; among them, bellum "*Hispaniense*," bellum "*servile*," bellum "*navale*."



Explain. 5. The expedition of the younger Cyrus against Persia, and that of Alexander: compare them. 6. Describe Athens. 7. Name in proper order the chief events of the Peloponnesian War, giving the geographical positions.

## XX.

1. Where were Corinth, Thebes, Ephesus, Tarentum, Massilia, Saguntum? Where were the Pyrenæi Montes? What sea on the east of Græcia? What large islands near Italia? What large gulf in the south of Italia? Name the chief rivers of Hispania. 2. Cicero enumerates the wars in which *Pompeius* had distinguished himself; among them bellum "*Hispaniense*," bellum "*servile*," bellum "*navale*." Explain. 3. Three important battles in Grecian history;—name the victorious and the vanquished party, and show the importance of the battles. 4. The expedition of Cyrus the Younger against Persia. 5. The siege of Syracuse. 6. The Athenian power at the beginning, and at the end, of the Peloponnesian War. How long did the war last? 7. The first secession of the Plebs: date, cause, and result. 8. The important battles of the Second Punic War; the commanders and victors in each. 9. The Gracchi, and their attempts at reform.

## XXI.

1. From Cæsar: "Extremum oppidum Allobrogum est proximumque Helvetiorum finibus, *Geneva*." "A lacu *Lemanno*, qui in flumen *Rhodanum* influit, ad montem *Juram* fossam perduxit." "Flumen est *Arar*, quod per fines *Æduorum* et *Sequanorum* in *Rhodanum* influit, incredibili lenitate, ita ut oculis, in utram partem fluat, judicari non possit." Translate these passages. Describe the geographical

situation of the places, etc., italicized, and give the modern names. What important town is at the junction of what were the Rhodanus and the Arar? 2. From Cicero: "Pompeius nondum tempestivo ad navigandum mari *Siciliam* adiit, *Africam* exploravit; inde *Sardiniam* cum classe venit. Inde cum se in *Italiam* recepisset, *duabus Hispaniis* et *Gallia Cisalpina* præsidiis ac navibus confirmata, missis item in oram *Illyrici Maris* et in *Achaiam* omnemque Græciam navibus, *Italiae duo maria* maximis classibus firmissimisque præsidiis adornavit: ipse autem, ut a *Brundisio* profectus est, undequinquagesimo die totam ad imperium populi Romani *Ciliciam* adjunxit." Give a translation and a geographical description. 3. Where were Argos, Sparta, Salamis, Mt. Olympus, Mt. Ida, Sardis? What gulfs are separated by the Isthmus of Corinth? Name the chief rivers of Gallia, giving both ancient and modern names. 4. Marathon, Thermopylæ, Plataea, — geographically and historically. 5. Athens in the time of Pericles. 6. The Sicilian expedition. 7. Epaminondas, and the supremacy of Thebes. 8. Themistocles and Aristides. 9. Philip of Macedon, and the battle of Chæronea.

## XXII.

1. "Sit Scipio ille clarus, cujus consilio atque virtute Hannibal in *Africam* redire atque *Italia* decedere coactus est; ornetur alter eximia laude *Africanus*, qui duas urbes huic imperio infestissimas, *Carthaginem* *Numantiamque*, delevit; habeatur vir egregius *Paulus* ille, cujus currum rex potentissimus quondam et nobilissimus *Perses* honestavit; sit æterna gloria *Marius*, qui bis *Italiam* obsidione et metu servitutis liberavit; anteponatur omnibus *Pompeius*, cujus res gestæ atque virtutes iisdem quibus solis cursus regionibus ac terminis continentur." Explain this passage

from Cicero by brief notes, without writing a translation of it. 2. From what places, etc., did the Bosporani, the Cyziceni, the Cretenses, the Rhodii, mentioned by Cicero, respectively derive their names? Where were those places? Where were Brundisium, Caieta, Cilicia? 3. Give the divisions of the Peloponnesus, with their relative position, and name a place in each. Connect historically Mantinea with Leuctra in Bœotia. 4. What, and where, were the chief settlements made outside of Greece by Greeks? Describe the great Sicilian expedition. 5. Point out and describe the main causes of the growth and decline of the Athenian power. 6. What were the relations at different times between the Persian kings and the Greeks?

## XXIII.

1. Give a brief account of Cæsar's campaign against the Helvetii. Fix the position of the following: Lacus Lemanus, the Rhodanus, the Allobroges, the Arar, Geneva. What part did the Allobroges play in the Catilinarian conspiracy? 2. "*Inde cum se in Italiam [Pompeius] recepisset, duabus Hispaniis et Gallia Cisalpina præsidiis ac navibus confirmata, missis item in oram Illyrici Maris et in Achaiam omnemque Græciam navibus, Italiæ duo maria maximis classibus firmissimisque præsidiis adornavit; ipse autem, ut a Brundisio profectus est, undequinquagesimo die totam ad imperium populi Romani Ciliciam adjunxit.*" Fix the position of the italicized provinces, towns, etc., without translating the passage. 3. Corinth, Philippi, Antioch, Sardis, Ephesus, Smyrna, — where situated? 4. Name the chief battles in which Greeks and Persians were engaged between 500 and 300 B. C. Fix the positions, give the dates, and show the importance of the several battles. 5. Name some of the chief islands belonging to

Greeks or settled by Greeks, and point out the situation of each. 6. The conquest of Greece by the Romans. Why were the Romans more successful than the Persians had been? 7. Themistocles and Pericles. 8. Pausanias and Lysander.

## XXIV.

1. "Interfectus est propter quasdam seditionum suspiciones *C. Gracchus*." (Cicero.) Translate and explain.
2. "Etenim recordamini, Quirites, omnes *civiles dissensiones*, neque (solum) eas quas audistis, sed et has quas vosmetipsi meministis et vidistis." (Cicero.) Translate and explain.
3. "Majores vestri *cum Antiocho, cum Philippo, cum Pœnis* bella gesserunt." (Cicero.) Translate and explain.
4. Brundisium, Caieta, Ostia, Gallia Cisalpina, Samos, Cilicia, Pontus (the country). (Cicero.) Give the position of each.
5. "Classes æratas, *Actia* bella,

Cernere erat; totumque instructo Marte videres  
Fervere *Leucaten* (auroque), effulgere fluctus.

*Regina* in mediis patrio (vocat) agmina sistro,

Needum etiam geminos a tergo respicit *angues*." (Virgil.) Translate and explain. 6. Olympia and the Olympic Games. The Olympiads. 7. Describe the battle of Marathon and the battle of Salamis. 8. The character, policy, and works of Pericles. 9. Name the principal events which mark the decline and fall of the Athenian power. 10. The most brilliant period and the most noted men in the history of Thebes. Mention *two* battles, give the geographical site of each, and date *one* of them. 11. Demosthenes. 12. Alexander's empire, and the kingdoms into which it broke up. Date his death.

## XXV.

1. "Hæc (sc. *Italia*) genus acre virûm, Marsosque, pubem-  
que Sabellam,

Adsuetumque malo Ligurem, Volscosque verutos  
Extulit; hæc *Decios, Marios*, magnosque *Camillos*,  
*Scipiadas* duros bello, et te, maxime Cæsar." (Virgil)

2. "Nos, quorum majores *Antiochum* regem classe *Persenque*  
superarunt, omnibusque navalibus pugnis *Carthaginienses*  
. . . . vicerunt, ii nullo in loco jam prædonibus pares esse  
poteramus." (Cicero.) (Ii may be rendered, imperfectly,  
by *even we*.)

3. "Ego enim sic existimo: *Maximo, Marcello, Scipioni, Mario*, et ceteris magnis imperatoribus, non solum  
propter virtutem, sed etiam propter fortunam, sæpius im-  
peria mandata atque exercitus esse commissos." (Cicero.)

With this passage, take the following from Virgil:—

"Tu *Maximus* ille es,

Unus qui nobis cunctando restituis rem."

4. Describe the city of Athens. 5. Name and describe  
some important places and events which are associated  
with the rivalry between Athens and Sparta. 6. What  
were the causes of the fall of the Athenian power? 7. The  
first Darius and the last Darius: how were they con-  
nected with Grecian history? 8. Name some of the Greek  
islands, and give their situation, with anything memorable  
in their history. 9. The rise and fall of the Achæan  
League. 10. What Romans gained great victories over  
Greeks? when, and where? 11. Name the sections or  
provinces of the Peloponnesus, and point out places of  
historical importance. (Draw a map, if you choose.)

## MODERN AND PHYSICAL GEOGRAPHY.

## I.

1. GIVE a physical description of Italy. 2. Define *plateau*, *delta*, *steppe*, *bight*, *lagoon*, *glacier*. What is the *profile* of a country? 3. How many degrees apart from each other are the two polar circles? What is the breadth (in degrees) of the torrid zone? What is the shortest distance in degrees of longitude between Madras ( $80^{\circ}$  E. from Greenwich) and San Francisco ( $122\frac{1}{2}^{\circ}$  W.)? 4. Describe the chief physical features of the State in which you live. 5. Describe the Andes, and one of the three great river systems of South America. 6. Name the rivers connected with the lakes of Switzerland and of Northern Italy, and give their source, course, and end. 7. The Vosges, the Jura, the Carpathians; Mt. Everest, Mt. Chimborazo, Mont Blanc, Monte Rosa, Mt. St. Elias. Give their position. 8. To what powers belong the Azores, Corsica, Malta, Heligoland, Algeria, Batavia, Manilla, Sydney, Havana? 9. Constantinople, Alexandria, Gibraltar, New York, New Orleans, Hamburg, — show the convenience or importance of the position of each.

## II.

1. What is meant by the terms "latitude" and "longitude"? 2. Give the approximate longitude, reckoned from the meridian of Greenwich, of London; New York; Cape Horn; the Cape of Good Hope; Melbourne; Shanghai; the Sandwich Islands. 3. Name and give the position, with reference to the various countries, of the principal moun-

tain chains of Europe. 4. Name and give the position and direction of the principal mountain ranges of North and South America. 5. Describe the principal rivers of North America, giving an approximate statement of the position of their sources, the direction in which they run, and their lengths. 6. Describe the principal rivers of Europe, in the manner indicated in the preceding question. 7. Name the principal islands of the East Indies, and state to what political powers they belong. 8. Name the West India Islands, and state to what powers they belong. 9. Describe the position of France with reference to the adjacent countries, rivers, mountains, and seas. 10. What are the advantages of London with regard to its geographical position? of St. Louis? of Chicago? of San Francisco? 11. What are the principal exports of England? of the United States? of Russia? of Central America? 12. State approximately the population of the most important states of Europe.

### III.

1. Where is Manila? Through what waters and across what countries would you pass in travelling from Manila to New York, (a) entirely by water, (b) partly by water and partly by land? 2. Explain what is meant by *latitude* and *longitude*. What is the longitude of the point in the northern hemisphere directly opposite Washington? (Assume longitude of Washington  $77^{\circ}$  W.) What is the latitude and longitude of the point in the southern hemisphere directly opposite Cambridge? The latitude of Cambridge is  $42^{\circ} 23' N.$ , the longitude  $71^{\circ} 7' W.$  3. Mention the different bodies of water surrounding the British Islands, and the rivers flowing into each. 4. Give as precisely as you can the position of the following mountains, and state,

where possible, to what range each belongs : — Washington ; St. Elias ; Hecla ; Elburz ; Pike's Peak ; Dwalagiri ; Chimborazo ; Shasta ; Orizaba. 5. Enumerate the States and Territories through or by which the Mississippi, Missouri, and Ohio Rivers flow. 6. State the principal conditions which determine the head of navigation on a river. Name the town or city at the head of navigation on two rivers in the United States, and on one in Europe. 7. State what you know about the Gulf Stream.

#### IV.

1. State as precisely as you can where the following rivers rise and empty, their general directions, and the countries or states which they cross or bound : — Amazon ; Rhine ; Connecticut ; Volga ; Indus ; Ohio ; Obi ; St. Lawrence. 2. Explain the terms *latitude* and *longitude*. Given the longitude of Melbourne as  $145^{\circ}$  E. when referred to Greenwich, what would be its longitude when referred to Washington ? (Washington lies  $77^{\circ}$  west of Greenwich.) 3. Describe the coast of Asia from Behring's Strait to the Strait of Malacca, mentioning the peninsulas, the seas, the mouths of important rivers, and the islands lying near the mainland. (Draw a map comprising these particulars, if you prefer.) 4. What is meant by the *snow line* ? Name some countries in which the snow line is very high. 5. Mention the principal islands in the Atlantic Ocean, and state to what political power each belongs. 6. Bound France, and give the name and position of four of its chief cities. 7. Name and give the position of the principal mountain ranges of North and South America. 8. Bound Pennsylvania. What mountains cross the State ? What are its principal rivers ? How does it rank with the other States as to area ? as to population ?



## GREEK COMPOSITION.

## I.

1. WHAT then? When<sup>1</sup> the Athenians and my [fellow] citizens<sup>2</sup> come,<sup>3</sup> let us summon<sup>4</sup> this man also; that we may consult<sup>5</sup> together.<sup>6</sup> 2. Cyrus said, "If you go<sup>7</sup> now, when<sup>8</sup> shall you be at home?"<sup>9</sup> 3. O my country!<sup>10</sup> O that all who inhabit<sup>11</sup> thee would love thee as I now do! 4. Not many days after this, Chares<sup>12</sup> came from Athens with<sup>13</sup> a few<sup>14</sup> ships; and immediately the Lacedæmonians and Athenians fought a naval battle.<sup>15</sup> The Lacedæmonians were victorious,<sup>16</sup> under the lead<sup>17</sup> of Hegesandridas.<sup>18</sup>

1. ἐπειδάν. 2. πολίτης. 3. ἔρχομαι. 4. καλέω. 5. συμβουλεύω (mid.). 6. κοινῇ. 7. εἰμι. 8. πότε. 9. οἴκοι. 10. πατρίς. 11. οἰκέω. 12. Χάρης. 13. ἔχων. 14. ὀλίγος. 15. ναυμαχέω. 16. νικάω. 17. ἡγέομαι (gen. absol.). 18. Ἡγησανδρίδας.

## II.

1. After these things, Pericles rose,<sup>1</sup> and thus spoke. 2. Do not obey<sup>2</sup> these most wicked men. 3. On the next<sup>3</sup> day he gave them what he promised.<sup>4</sup> 4. All the Greeks happened<sup>5</sup> to be doing this. 5. Many fear lest these things should happen<sup>6</sup> while Philip is king.<sup>7</sup> 6. If these things were true,<sup>8</sup> it would be still more terrible.<sup>9</sup>

1. ἀνίστημι. 2. πείθω. 3. ὑστεραίος. 4. ἐπισχέομαι. 5. τυγχάνω with the participle. 6. γίγνομαι. 7. genitive absolute. 8. ἀληθής. 9. δεινός.

## III.

1. Any one might justly<sup>1</sup> praise<sup>2</sup> him, not only for<sup>3</sup> these things, but for what he did about<sup>4</sup> the same time.<sup>5</sup>  
 2. If you, do<sup>6</sup> what I just<sup>7</sup> now told<sup>8</sup> you, you will have all things which any one could wish.<sup>9</sup> 3. O that<sup>10</sup> these things had happened<sup>11</sup> as we wished!<sup>9</sup> But since<sup>12</sup> we were unfortunate,<sup>13</sup> let us do what the wisest of us shall command.<sup>14</sup> 4. If these men had not perished,<sup>15</sup> the city would have been saved<sup>16</sup> and we should now be free.<sup>17</sup>

1. δικαίως. 2. ἐπαινέω. 3. ἐπί. 4. περί. 5. χρόνος. 6. ποίω. 7. ἄρτι. 8. φράζω. 9. βούλομαι. 10. εἴθε. 11. γίγνομαι. 12. ἐπει. 13. ἀτυχής. 14. κελεύω. 15. ἀπόλλυμι. 16. σώζω. 17. ελευθερος.

## IV.

1. If I appear<sup>1</sup> to be wrong,<sup>2</sup> I will pay<sup>3</sup> the penalty.  
 2. If you should turn<sup>4</sup> from evils, you would quickly<sup>5</sup> become<sup>6</sup> better. 3. I fear<sup>7</sup> lest we have forgotten<sup>8</sup> the road<sup>9</sup> home.<sup>10</sup> 4. If Philip had had this opinion,<sup>11</sup> — that it is difficult<sup>12</sup> to fight<sup>13</sup> with the Athenians, — he would have done<sup>14</sup> no one of the things which he has done.

1. δοκέω. 2. ἀδικέω. 3. δίκην δούναι. 4. ἀποτρέπομαι. 5. ἐν τάχει. 6. γίγνομαι. 7. δαίδομαι. 8. ἐπιλανθάνομαι. 9. ὁδός. 10. αἴκαλε. 11. γνώμη. 12. χαλεπός. 13. πολεμέω. 14. πράσσω.

## V.

1. Those who were looking<sup>1</sup> on feared<sup>2</sup> lest their friends<sup>3</sup> should suffer<sup>4</sup> anything. 2. They all said<sup>5</sup> that the king<sup>6</sup> had sent<sup>7</sup> them, and that they wished<sup>8</sup> to make an alliance<sup>9</sup> with Cyrus. 3. If another shall come<sup>10</sup> in his own name,<sup>11</sup> him ye will receive.<sup>12</sup> 4. When this had hap-

pened,<sup>13</sup> all believed<sup>14</sup> that an assembly<sup>15</sup> would be summoned.<sup>16</sup>

1. θεάομαι (partic.). 2. φοβέομαι. 3. φίλος. 4. πάσχω. 5. λέγω with ὅτι. 6. βασιλεύς. 7. πέμπω. 8. βούλομαι. 9. συμμαχέω. 10. ἔρχομαι. 11. ὄνομα. 12. λαμβάνω. 13. γίγνομαι. 14. οἶμαι. 15. ἐκκλησία. 16. συγκαλέω.

## VI.

1. You would be approved,<sup>1</sup> should you appear<sup>2</sup> not to do those things which you would blame<sup>3</sup> others for doing. 2. Swear<sup>4</sup> by no<sup>5</sup> god for the sake of<sup>6</sup> money, not even<sup>7</sup> if you are not about<sup>8</sup> to violate<sup>9</sup> your faith.<sup>10</sup> 3. The king<sup>11</sup> said<sup>12</sup> that the messenger<sup>13</sup> was not then present,<sup>14</sup> and that, if he had been, these things would not have occurred.<sup>15</sup> 4. Would that I had<sup>16</sup> the wings<sup>17</sup> of an eagle,<sup>18</sup> that leaving<sup>19</sup> the earth<sup>20</sup> I might be numbered<sup>21</sup> among<sup>22</sup> the stars!<sup>23</sup>

1. εὐδοκίμew. 2. φαίνομαι. 3. ἐπιτιμάw. 4. ὀμνυμι. 5. μηδεῖς or οὐδεῖς? 6. ἕνεκα. 7. μηδέ. 8. μέλλειν. 9. παραβαίνειν. 10. πίστις. 11. βασιλεύς. 12. λέγειν with ὅτι. 13. ἄγγελος. 14. πάρεμι. 15. γίγνομαι. 16. ἔχειν. 17. πτερόν. 18. αἰτός. 19. λείπω. 20. γῆ. 21. ἀριθμέw. 22. ἐν. 23. ἄστρον.

## VII.

1. I tried<sup>1</sup> to show<sup>2</sup> him that<sup>3</sup> he thought<sup>4</sup> he was wise, but<sup>5</sup> was not. 2. He says<sup>6</sup> that these things happened<sup>7</sup> while Cyrus<sup>19</sup> was king.<sup>8</sup> 3. Let no one believe<sup>9</sup> that I now fear<sup>10</sup> lest our state<sup>11</sup> be ruined.<sup>12</sup> 4. If these men were not unjust,<sup>13</sup> they would not have condemned<sup>14</sup> these generals<sup>15</sup> to death.<sup>16</sup> 5. He burned<sup>17</sup> the vessels,<sup>18</sup> that Cyrus<sup>19</sup> might not pass over.<sup>20</sup>

1. πειράομαι. 2. δείκνυμι. 3. ὅτι. 4. οἶμαι (with infin.).

5. *δέ* (with preceding *μέν*). 6. *φημί* (with infin.). 7. *γίγνομαι*. 8. participle of *βασιλεύω*. 9. *νομίζω* (with infin.). 10. *φοβέομαι*. 11. *πῶλις*. 12. *ἀπόλλυμι* (2d aor. mid.). 13. *ἀδικέω*. 14. *καταγιγνώσκω*. 15. *στρατηγός*. 16. *θάνατος*. 17. *κατακάω*. 18. *πλοῖον*. 19. *Κῦρος*. 20. *διαβαίνω*.

## VIII.

1. The king<sup>1</sup> is chosen<sup>2</sup> in order that those who choose<sup>2</sup> him may be benefited<sup>3</sup> by<sup>4</sup> him. 2. They said<sup>5</sup> that Cyrus<sup>6</sup> was dead,<sup>7</sup> and that Ariæus<sup>8</sup> would flee.<sup>9</sup> 3. If he had been here,<sup>10</sup> would he have overlooked<sup>11</sup> these things, or have punished<sup>12</sup> these impious<sup>13</sup> men? 4. May we desire<sup>14</sup> only<sup>15</sup> those things which we shall rejoice<sup>15</sup> to have acquired.<sup>16</sup> 5. Before<sup>18</sup> he came,<sup>19</sup> the ships<sup>20</sup> happened<sup>21</sup> to have gone<sup>22</sup> to Caria<sup>23</sup> to summon<sup>24</sup> assistance.<sup>25</sup>

1. *βασιλεύς*. 2. *αἰρέω*. 3. *εὖ πράττειν*. 4. *διὰ*. 5. *λέγω* (*ὅτι*). 6. *Κῦρος*. 7. *θνήσκω*. 8. *Ἀριαῖος*. 9. *φεύγω*. 10. *πάρειμι*. 11. *περιοράω*. 12. *κολάζω*. 13. *ἀσεβής*. 14. *ἐπιθυμέω*. 15. *χαίρω*. 16. *κέκτημαι*. 17. *μόνον*. 18. *πρίν*. 19. *ἔρχομαι*. 20. *ναῦς*. 21. *τυγχάνω*. 22. *οἶχομαι*. 23. *Καρία*. 24. *περιαγγέλλω* (participle). 25. *βοηθεῖν*.

## IX.

1. All of them fear<sup>1</sup> lest they may be compelled<sup>2</sup> to do many<sup>3</sup> things which now they do not wish<sup>4</sup> to do. 2. O that<sup>5</sup> this man had had<sup>6</sup> strength<sup>7</sup> equal<sup>8</sup> to his mind.<sup>9</sup> 3. They called in<sup>10</sup> physicians<sup>11</sup> when they were sick,<sup>12</sup> that they might not die.<sup>13</sup> 4. He showed<sup>14</sup> that he was ready<sup>15</sup> to fight<sup>16</sup> if any one should come out.<sup>17</sup>

1. *φοβέομαι*. 2. *ἀναγκάζω*. 3. *πολύς*. 4. *βούλομαι*. 5. *εἴθε*. 6. *ἔχω*. 7. *ῥώμη*. 8. *ἴσος*. 9. *γνώμη*. 10. *παρακαλῶ*. 11. *ιατρός*. 12. *νοσῶ* (partic.). 13. *ἀποθνήσκω*. 14. *δηλώνω* (with *ὅτι*). 15. *ἔτοιμος*. 16. *μάχομαι*. 17. *ἐξέρχομαι*.

## X.

1. He said<sup>1</sup> that he had come<sup>2</sup> that he might see<sup>3</sup> both what was doing and what had been done. 2. I told him that, if these things had been true,<sup>4</sup> this would not have happened.<sup>5</sup> 3. Would that he were alive;<sup>7</sup> for he would not fear<sup>8</sup> these dangers<sup>9</sup> as you do. 4. Do you wish<sup>6</sup> me to come?<sup>2</sup> Tell<sup>1</sup> him not to fear<sup>8</sup> me, thinking<sup>10</sup> I shall be angry.<sup>11</sup>

1. λέγω. 2. ἔρχομαι. 3. δρᾶω. 4. ἀληθής. 5. γίγνομαι. 6. βούλομαι. 7. ζάω. 8. φοβοῦμαι. 9. κίνδυνος. 10. οἶομαι. 11. χαλεπαίνω.

## XI.

1. It is said<sup>1</sup> that the king<sup>2</sup> sent them away,<sup>3</sup> fearing<sup>4</sup> lest they should perish<sup>5</sup> by remaining.<sup>6</sup> 2. Athens,<sup>7</sup> although it was<sup>8</sup> great<sup>9</sup> before,<sup>10</sup> then became<sup>11</sup> greater, having been freed<sup>12</sup> from tyrants.<sup>13</sup> 3. Who of all the Greeks would not justly<sup>14</sup> have hated<sup>15</sup> us, if we had fled<sup>16</sup> and had left<sup>17</sup> our city to the barbarians?<sup>18</sup> 4. Call<sup>19</sup> no one happy<sup>20</sup> before<sup>21</sup> he is dead.<sup>22</sup>

1. λέγω. 2. βασιλεύς. 3. ἀποπέμπω. 4. φοβέομαι. 5. ἀπώλωμι. 6. μένω. 7. Ἀθῆναι. 8. Participle of εἰμί. 9. μέγας. 10. πρὶν. 11. γίγνομαι. 12. ἀπαλλάσσω. 13. τύραννος. 14. δικαίως. 15. μισέω. 16. φεύγω. 17. καταλείπω. 18. βάρβαρος. 19. καλέω. 20. εὐβιος. 21. πρὶν. 22. τελευτάω.

## XII.

1. Wish<sup>1</sup> to be a friend<sup>2</sup> of the powerful,<sup>3</sup> in order that you may not suffer punishment<sup>4</sup> if you act unjustly.<sup>5</sup> 2. We fear<sup>6</sup> lest,<sup>7</sup> if we do<sup>8</sup> this, we shall miss<sup>9</sup> at once<sup>10</sup> what we have gained<sup>11</sup> and what we hope<sup>12</sup> to gain. 3. The messenger<sup>13</sup> came<sup>14</sup> to announce<sup>15</sup> that the city had

been taken,<sup>16</sup> but that the citizens<sup>17</sup> were hidden<sup>18</sup> near<sup>19</sup> the sea.<sup>20</sup> 4. Would<sup>21</sup> that he had died<sup>22</sup> in his youth,<sup>23</sup> for<sup>24</sup> he now would be happy.<sup>25</sup>

1. βούλομαι. 2. φίλος. 3. to be powerful, δύνασθαι. 4. δίκην δοῦναι. 5. ἀδικεῖν. 6. φοβοῦμαι. 7. μή. 8. πράττω. 9. ἁμαρτάνω. 10. ἄμα. 11. τυγχάνω. 12. ἐλπίζω. 13. ἄγγελος. 14. ἔρχομαι. 15. ἀγγέλλω. 16. ἀλίσκομαι. 17. πολίτης. 18. κρύπτω. 19. παρά. 20. θάλαττα. 21. εἴθε. 22. ἀποθνήσκω. 23. a young man, νεανίσκος. 24. ἐπεὶ. 25. εὐδαίμων.

## XIII.

1. I trust<sup>1</sup> that these things which you have heard<sup>2</sup> are true.<sup>3</sup> 2. Who would not wish<sup>4</sup> to leave his country,<sup>5</sup> when such base<sup>6</sup> men are in power?<sup>7</sup> 3. The same men were present<sup>8</sup> when these things happened.<sup>9</sup> 4. He said<sup>10</sup> that, although he was<sup>11</sup> a god, he wished<sup>4</sup> to die.<sup>12</sup>

1. πιστεύω. 2. ἀκούω. 3. ἀληθής. 4. βούλομαι. 5. πατρίς. 6. πονηρός. 7. κρατέω (partic.). 8. πάρειμι. 9. γίγνομαι. 10. εἶπον. 11. participle. 12. ἀποθνήσκω.

## XIV.

1. After these things, a battle<sup>1</sup> having taken place,<sup>2</sup> the Greeks were victorious.<sup>3</sup> 2. The king himself came as quickly<sup>4</sup> as possible<sup>5</sup> with the army.<sup>6</sup> 3. The same general<sup>7</sup> commanded<sup>8</sup> the army in both<sup>9</sup> the battles. 4. Many of the children<sup>10</sup> whom he saw feared<sup>11</sup> lest they should be taken.<sup>12</sup> 5. If these things had been true,<sup>13</sup> it would have been still<sup>14</sup> more terrible.<sup>15</sup>

1. μάχη. 2. γίγνομαι. 3. νικάω. 4. ταχύ. 5. ὥς. 6. στρατεύμα. 7. στρατηγός. 8. ἡγέομαι. 9. ἀμφότερος. 10. παῖς. 11. φοβέομαι. 12. λαμβάνω. 13. ἀληθής. 14. ἔτι. 15. δεινός.

## XV.

1. I told<sup>1</sup> him that you all<sup>2</sup> were my<sup>3</sup> friends.<sup>4</sup> 2. He acts<sup>5</sup> thus<sup>6</sup> that he may not seem<sup>7</sup> to wrong<sup>8</sup> the state.<sup>9</sup> 3. If he had been just,<sup>10</sup> this would not have happened.<sup>11</sup> 4. Do you think<sup>12</sup> they will flee<sup>13</sup> when<sup>14</sup> they see<sup>15</sup> us ?

1. λέγω. 2. πᾶς. 3. possessive dative. 4. φίλος. 5. πράττω. 6. οὕτως. 7. δοκέω. 8. ἀδικέω. 9. πόλις. 10. δίκαιος. 11. γίγνομαι. 12. οἶμαι. 13. φεύγω. 14. ὅταν. 15. ὁράω.

## XVI.

1. They came<sup>1</sup> in order to destroy<sup>2</sup> their<sup>3</sup> enemies.<sup>4</sup> 2. If you should say<sup>5</sup> this, he would be angry.<sup>6</sup> 3. The men<sup>7</sup> reported<sup>8</sup> that they had seen<sup>9</sup> no one.<sup>10</sup> 4. He declares<sup>11</sup> that he expects<sup>12</sup> to die.<sup>13</sup>

1. ἔρχομαι. 2. ἀπόλλυμι. 3. article. 4. ἐχθρός. 5. λέγω. 6. χαλεπαίνω. 7. ἀνὴρ. 8. ἀπαγγέλλω. 9. ὁράω. 10. οὐδεὶς. 11. ἀποφαίνομαι. 12. οἶμαι. 13. θνήσκω.

## XVII.

1. While<sup>1</sup> Alexander<sup>2</sup> was<sup>1</sup> in the country<sup>3</sup> of the Uxii,<sup>4</sup> his horse Bucephalus<sup>5</sup> was<sup>6</sup> once<sup>7</sup> missing.<sup>8</sup>

1. participle. 2. Ἀλέξανδρος. 3. χώρα. 4. Οὐξιοί. 5. Βουκεφάλας. 6. γίγνομαι. 7. omit. 8. ἀφανής.

2. Accordingly,<sup>1</sup> he proclaimed<sup>2</sup> through<sup>3</sup> the country that he would kill<sup>4</sup> all the Uxii, unless they brought<sup>5</sup> him back his horse.

1. οὖν. 2. προκηρύττω. 3. ἀνά. 4. ἀποκτείνω. 5. ἀπάγω.

3. And such<sup>1</sup> fear<sup>2</sup> of the king had<sup>3</sup> the barbarians, that<sup>4</sup> Bucephalus was sent<sup>5</sup> back directly<sup>6</sup> upon<sup>7</sup> the proclamation.<sup>8</sup>

1. τοσούτοι. 2. φόβος. 3. use εἰμί. 4. ὥστε. 5. ἀποπέμπω. 6. εὐθύς. 7. ἐπὶ. 8. κήρυγμα.

## XVIII.

1. Did not Homer<sup>1</sup> call<sup>2</sup> Agamemnon<sup>3</sup> shepherd<sup>4</sup> of the people,<sup>5</sup> because a general<sup>6</sup> ought<sup>7</sup> to take care<sup>8</sup> that his soldiers<sup>9</sup> be both<sup>10</sup> safe<sup>11</sup> and<sup>10</sup> prosperous?<sup>12</sup>

1. Ὅμηρος. 2. προσαγορεύω. 3. Ἀγαμέμνων. 4. ποιμήν. 5. λαός. 6. στρατηγός. 7. δεῖ. 8. ἐπιμελείομαι. 9. στρατιώτης. 10. τε καί. 11. σῶς. 12. εὐδαίμων.

2. For<sup>1</sup> you know<sup>2</sup> that generals are chosen<sup>3</sup> to be authors<sup>4</sup> of prosperity<sup>5</sup> to those who chose them.

1. γάρ. 2. οἶδα. 3. αἰρίομαι. 4. αἴτιος. 5. εὐδαιμονία.

3. It seems<sup>1</sup> to me, therefore,<sup>2</sup> that Agamemnon would not have been applauded<sup>3</sup> by Homer, had he not been excellent<sup>4</sup> in this particular.<sup>5</sup>

1. δοκέω. 2. οὖν. 3. ἐπαινέω. 4. from ἀγαθός. 5. omit.

## XIX.

1. As<sup>1</sup> Xenophon<sup>2</sup> was<sup>1</sup> sacrificing,<sup>3</sup> a messenger<sup>4</sup> arrived<sup>5</sup> from Mantinea,<sup>6</sup> announcing<sup>7</sup> that his son<sup>8</sup> Gryllus<sup>9</sup> was dead.<sup>10</sup>

1. omit. 2. Ξενοφῶν. 3. θύω. 4. ἄγγελος. 5. ἦλθω. 6. Μαντίνεια. 7. λέγω. 8. υἱός. 9. Γρύλλος. 10. to die, θνήσχω.

2. Then<sup>1</sup> he<sup>2</sup> laid<sup>3</sup> aside the garland,<sup>4</sup> but<sup>5</sup> continued to sacrifice.<sup>6</sup>

1. καί. 2. ἐκείνος. 3. ἀποτίθεμαι. 4. στέφανος. 5. δέ preceded by μέν. 6. διατελείω.

3. But when<sup>1</sup> the messenger had added<sup>2</sup> this<sup>3</sup> also,<sup>4</sup> that he had died victorious,<sup>5</sup> Xenophon put<sup>6</sup> the garland on<sup>6</sup> again.<sup>7</sup>

1. ἐπεὶ. 2. προστίθημι. 3. ἐκείνος. 4. καί. 5. καὶ (participle). 6. ἐπιτίθεμαι. 7. πάλιν.



## XX.

1. Themistocles<sup>1</sup> said<sup>2</sup> that the trophies<sup>3</sup> of Miltiades<sup>4</sup> woke<sup>5</sup> him from his sleep.<sup>6</sup>

1. Θεμιστοκλῆς. 2. λέγω. 3. τρόπαιον. 4. Μιλτιάδης. 5. ἀνίστημι. 6. ὕπνος.

2. Do not hasten<sup>1</sup> to be<sup>2</sup> rich,<sup>3</sup> lest thou speedily<sup>3</sup> become<sup>4</sup> poor.<sup>5</sup>

1. σπεύδω. 2. πλουτέω. 3. ταχύ. 4. γίγνομαι. 5. πένη.

3. If he shall slay<sup>1</sup> his<sup>2</sup> enemy,<sup>3</sup> he will pollute<sup>4</sup> his hand.<sup>5</sup>

1. ἀποκτείνω. 2. possess. genit. 3. ἐχθρός. 4. μαινώ. 5. χεῖρ.

4. A report<sup>1</sup> was spread<sup>2</sup> abroad<sup>2</sup> that the allies<sup>3</sup> had revolted<sup>4</sup> from the city.<sup>5</sup>

1. λόγος. 2. διασπείρω. 3. σύμμαχος. 4. ἀφίστημι. 5. πόλις.

## XXI.

1. It became<sup>1</sup> evident,<sup>2</sup> that<sup>3</sup> the Greeks strongly<sup>4</sup> feared<sup>5</sup> lest he should become a tyrant.<sup>6</sup> 2. The god, as it seems,<sup>7</sup> often<sup>8</sup> rejoices<sup>9</sup> in making<sup>10</sup> the small great, and<sup>11</sup> the great small. 3. The Thebans after this raised<sup>12</sup> a trophy,<sup>13</sup> and gave up<sup>14</sup> the dead<sup>15</sup> under truce.<sup>16</sup> 4. He replied,<sup>17</sup> that he was not marching<sup>18</sup> that<sup>19</sup> he might do wrong<sup>20</sup> to any, but that he might assist<sup>21</sup> those who were wronged.<sup>22</sup>

1. γίγνομαι. 2. δηλός. 3. ὅτι. 4. ἰσχυρῶς. 5. φοβέομαι. 6. τύραννος. 7. ζοικα. 8. πολλάκις. 9. χαίρω. 10. participle of ποίω. 11. δέ (with preceding μέν). 12. ἵστημι. 13. τρόπαιον. 14. ἀποδίδωμαι. 15. νεκρός. 16. ὑπόσπονδος. 17. ἀποκρίσομαι. 18. στρατεύομαι. 19. ἵνα. 20. ἀδικέω. 21. βοηθέω. 22. participle.

## XXXI.

1. He thought<sup>1</sup> that he needed<sup>2</sup> friends<sup>3</sup> for this purpose,<sup>4</sup> that he might have helpers.<sup>5</sup> 2. O that<sup>6</sup> I had as great<sup>7</sup> power<sup>8</sup> as<sup>9</sup> these kings now have! 3. They were not able<sup>10</sup> to prevent<sup>11</sup> Philip from passing through.<sup>12</sup> 4. They announced<sup>13</sup> that they should treat<sup>14</sup> all these enemies.<sup>15</sup>

1. οἶομαι (w. infin.). 2. δέομαι. 3. φίλος. 4. ἕνεκα. 5. συνέργος. 6. εἴθε. 7. τοσούτος. 8. δύναμις. 9. ὅσος. 10. δύναμαι. 11. καλῶν. 12. παρέρχομαι (aor.). 13. προαγορεύω (ᾄρι). 14. χράομαι (use). 15. πολέμιος.

## XXIII.

1. The king said that whoever killed<sup>1</sup> the man should rule<sup>2</sup> the whole city. 2. They feared<sup>3</sup> that the army would bring<sup>4</sup> aid to the inhabitants,<sup>5</sup> for they perceived<sup>6</sup> that the citizens were not despondent.<sup>7</sup> 3. The eagle<sup>8</sup> remained until<sup>9</sup> evening<sup>10</sup> came<sup>11</sup> on; and, terrified<sup>12</sup> by the sight,<sup>13</sup> we came to the soothsayers<sup>14</sup> to make<sup>15</sup> communication about<sup>16</sup> the omen.<sup>17</sup> 4. He hoped<sup>18</sup> that he should die<sup>19</sup> that day,<sup>20</sup> that he might be released<sup>21</sup> from his chains.<sup>22</sup> 5. Take<sup>23</sup> this soldier, and keep<sup>24</sup> him until<sup>25</sup> I come<sup>26</sup> with<sup>27</sup> the king's army. 6. Do not inflict<sup>28</sup> misery<sup>29</sup> on me who am miserable<sup>30</sup> already.<sup>30</sup>

1. ἀποκτείνω. 2. ἄρχω. 3. φοβοῦμαι. 4. βοηθέω. 5. ἐννοεῖται. 6. αἰσθάνομαι. 7. ἀδυνάμει. 8. ἀνέγχομαι. 9. ἕως. 10. ἑσπέρα. 11. ἐπιγίγνομαι. 12. ἐκπλήσσομαι. 13. ὄψιν. 14. ἀντιφρονέω. 15. ἐκκαλέομαι. 16. περὶ. 17. αἶον. 18. ἐλπίζω. 19. ἀποθνήσκω. 20. ἡμέρα. 21. λύω. 22. δεσμώτης. 23. λαμβάνω. 24. σφίζω. 25. ἔρχομαι. 26. ἔχω. 27. προστίθημι. 28. νόσος. 29. πένθος. 30. ἤδη.

## XXIV.

1. They say that when animals<sup>1</sup> were endowed<sup>2</sup> with voices, the sheep<sup>3</sup> said to her master<sup>4</sup>: "You do<sup>5</sup> a curious<sup>6</sup> thing,<sup>7</sup> because<sup>8</sup> to us who provide<sup>9</sup> you wool<sup>10</sup> and lambs<sup>11</sup> you give nothing that we don't take<sup>12</sup> from<sup>13</sup> the earth,<sup>14</sup> while<sup>15</sup> to the dog<sup>16</sup> you give<sup>17</sup> [-some-<sup>7</sup>] of the food<sup>18</sup> you have yourself." And that the dog, who had been listening,<sup>19</sup> said: "But I am your preserver,<sup>20</sup> so that you are not carried<sup>21</sup> off by wolves;<sup>22</sup> since,<sup>23</sup> if I should not guard<sup>24</sup> you, you could not feed,<sup>25</sup> through-fear<sup>26</sup> of death."<sup>27</sup>

1. ζῶον. 2. φωνήεις. 3. οἷς. 4. δεσπότης. 5. ποιέω. 6. θαυμαστός. 7. omit. 8. because you = relat. pronoun. 9. παρέχω. 10. ἔριον. 11. ἄρνες (plural). 12. λαμβάνω. 13. ἐκ. 14. γῆ. 15. δέ. 16. κύων. 17. μεταδίδωμι. 18. σῖτος. 19. ἀκούω. 20. σώζω. 21. ἀρπάζω. 22. λύκος. 23. ἐπεὶ. 24. φυλάττω. 25. νέμομαι. 26. φοβοῦμαι. 27. ἀπόλλυμι.

## XXV.

1. He was brought up<sup>1</sup> at<sup>2</sup> the court<sup>3</sup> of the king<sup>4</sup>; so that,<sup>5</sup> while<sup>6</sup> a boy,<sup>7</sup> he used to converse<sup>8</sup> with the best<sup>9</sup> of the Persians.<sup>10</sup> 2. Would that he had given<sup>11</sup> me what he promised<sup>12</sup> to give him! 3. Old men<sup>13</sup> say that life<sup>14</sup> is burdensome<sup>15</sup> to them; but if death<sup>16</sup> comes<sup>17</sup> near,<sup>18</sup> nobody wants<sup>19</sup> to die.<sup>20</sup>

1. παιδεύω. 2. ἐπὶ. 3. θύρα (plural). 4. βασιλεὺς. 5. ὥστε. 6. Participle of εἰμί. 7. παῖς. 8. διαλέγομαι. 9. ἀγαθός. 10. Πέρσης. 11. δίδωμι. 12. ὑπισχνέομαι. 13. γέρον. 14. ζῆω. 15. βαρύν. 16. θάνατος. 17. ἔρχομαι. 18. πλησίον. 19. βούλομαι. 20. ἀποθνήσκω.

## XXVI.

1. Seuthes asked, "Would you be willing, Episthenes, to die for this boy?" And he said, holding up his hands, "Strike, if the boy commands you to strike." 2. He feared that the men from the mountains would not make war with the Greeks.

N. B. — The sentences below need correction: write out corrected forms for them with a right translation.

3. Εἰ οὐδεὶς ἐρχομαι ἵνα ἀκούει ἔμε, οὐδεὶς σοφώτερος εἰσιν.

4. Ἀνίστησαν οἱ Ἕλληνες καὶ εἶπον τὸν παῖς εἰς τῷ πολέῳς τούτῳ εἶναι.

5. And Xenophon, on arriving, said to Seuthes, that the men were friendly, and would have sent mercenaries if he had asked it.

## XXVII.

1. The general with all his soldiers sailed away from the island, thinking that Cimon had come from Athens with twenty-seven ships. 2. The gods know well what it is best for man to have: to some they give much gold, to others a beautiful body, to others neither of these gifts. 3. (Write the following sentence in a *corrected* form, with the accents.)

Γὰρ εἶδωσα ἑμᾶντος αὐτοὺς ἑνα ταλαντον δε οἱ ἄνθρωποι ἐπανσονται μαχοντες.

## GREEK GRAMMAR.

## I.

1. Decline *θάλασσα*, *πλός*, and *λίον* *throughout*, and *γύψ* in the *singular*. Explain the Accent of the oblique cases of *γύψ*.
2. Decline the Adjective *μέλας*. Compare *σώφρων* and *σοφός*, and give the rules. Compare *μέγας*.
3. Decline *οὗτος* and *ἐμάντου*.
4. Give the rule for the Augment of verbs compounded with a preposition. Give the Imperfect Indicative Active of *ἐπιγράφω* and *περιγράφω*.
5. Give the rules for the formation of the Future Active. Inflect the Future Indicative Active of *ἀγγέλλω*.
6. Give the Second Aorist Indicative (Active, Passive, and Middle) of *λείπω*. Inflect the Present Optative Active of *τιμάω*.
7. Give a synopsis of the Second Aorist Active of *τίθημι*, and inflect the Imperative.
8. Mention any classes of verbs which are followed by the Genitive. How is the *Agent* expressed after verbals in *-τέος*?
9. *Κόμαι Χαρίτεσσιν ὁμοίαι* (hair resembling that of the Graces): Explain the Dative *Χαρίτεσσιν*.
10. What constructions follow *ἵνα* and *ὅπως* to denote a purpose? When is each construction used?
11. Divide the following verses into feet, and name the feet:—

Χαίρετε, κήρυκες, Διὸς ἄγγελοι ἡδὲ καὶ ἀνδρῶν,  
 Ἄσσον ἔτ' οὐτὶ μοι ὕμνος ἐπαίτιος, ἀλλ' Ἀγαμέμνων.

## II.

1. Decline the Nouns *μοῦσα* and *τείχος*. Explain the change of accent in *μοῦσα* where it is not the same as in the Nominative Singular. What nouns in *a* of the first declension have *as* in the Genitive Singular?
2. Decline the Adjective *χαρίεις* in the Singular.
3. Decline the Pronouns *σύ* and *οὗτος*.
4. What are the *syllabic* and *temporal* augments respectively? What is the *ordinary* reduplication, and what is the *Attic* reduplication?

5. Conjugate the Verbs *τρίβω*, *ἀγγέλλω*, and *γράφω*. Decline the Perfect Indicative Passive of *γράφω*, and explain the euphonic changes which the root *γραφ-* undergoes in that tense. 6. How is the Future Active of a *liquid* verb formed? 7. Give a synopsis of the Present and Second Aorist Active of *ίστημι*, and decline those tenses in the Indicative. 8. What is the difference between *ὁ σοφὸς ἄνθρωπος* and *ὁ ἄνθρωπος σοφός*? What does *ἄνθρωπος ὁ σοφός* mean? What do *αὐτὸς ὁ ἄνθρωπος* and *ὁ αὐτὸς ἄνθρωπος* mean? 9. In the phrase *ἐκ τούτων ὧν λέγει*, explain the case of *ὧν*. 10. In dependent clauses, which tenses of the Indicative are followed by the Subjunctive, and which by the Optative? 11. Translate *λαβάνει αὐτὸν σοφὸς ὧν*, and explain the use of *λαμβάνω* with the participle.

### III.

1. Which consonants are called *labials*, which *linguals*, and which *palatals*? Explain *Syncope* and *Crasis*, and give an example of each. 2. Define an *Enclitic*. Give the Enclitics which you remember. 3. Decline the Nouns *μοῦσα* and *πράγμα*. Give the rule for the *accent* of the Genitive Plural of each. 4. Compare *ἀληθής*, *ἀγαθός*, and *κακός*. 5. Decline *ἔδε* in the Singular, and *δοῖς* in the Plural. 6. Explain the *Attic Reduplication*, and give an example. How are verbs beginning with a *diphthong* augmented? Give the Imperfect and First Aorist Active of *αἰρέω*. 7. Inflect the First Aorist Middle Indicative of *βουλεύω*, and the Second Aorist Passive Optative of *λείπω*. 8. Give a synopsis of the Second Aorist Middle of *τίθημι* through all the moods, and inflect the Indicative. 9. Where are *εὔροι*, *εὐρήσοι*, and *εὐρεθῆναι* formed, and from what verb? 10. What cases follow Verbs of *accusing*, *prosecuting*, and *convicting*? If these verbs are compounded with *κατά*, what construction follows them? 11. Translate *ἐκ τούτων ὧν λέγει*, and *οἴχεται ὃν εἶδες ἄνθρωπον*. Explain the *attraction* in each case. 12. Explain the Genitive Absolute. When is the *Accusative Absolute* used?

SOPHOMORE QUESTIONS. — 1. Translate *Εἶπεν ὅτι τοῦτο ποιοίη*,

Εἶπεν ὅτι τοῦτο ποιήσοι, Εἶπεν ὅτι τοῦτο ποιήσειεν, and Εἶπεν ὅτι τοῦτο ποιήσει, — and explain the difference, wherever that is not made clear by the translation. 2. Translate ἐβούλετο τοῦτο ποιῆσαι, and ἔφη τοῦτο ποιῆσαι, — and explain the force of the Aorist Infinitive in each case. 3. Explain the difference between the Optative and the Secondary Tenses of the Indicative in expressions of a *wish*. Give an example of each.

## IV.

1. Explain the terms *Metathesis*, *Epenthesis*, *Syncope*, and give examples of each. 2. Give the general rules for accenting the Penult of Greek words. 3. Decline τελώνης and εβγεως, and state what nouns are indeclinable. 4. Compare the Adjectives μέλας and ἡδύς; the Adverbs μάλα and νύκτωρ. 5. Give the numeral Adverbs as far as δεκάκις, and write in full the Plural of the Article. 6. Give the Imperfect of περιγίγνομαι and ἀνέχω, also the Perfect Indicative of τρέβω, with the rule for its formation. 7. Inflect the Present Optative Active of τιμάω, and the Imperfect of τίθημι. Give the Imperative of εἰμί, and the Present Indicative of φημί. 8. Translate the words πλῆθει οἷπερ δικάζουσι, and give the rule for the use of the Relative. 9. What case follows verbs of *tasting*, and what cases follow causatives of this class? 10. Explain the use of the Infinitive after verbs of saying, thinking, etc., and give an example.

SOPHOMORE QUESTIONS. — 1. What tenses can be used to express a customary action, and what is the general rule for introducing quotations? 2. Translate πρὸ Ἑλλήνος οὐδὲ εἶναι τοῦτο τὸ ὄνομα δοκεῖ, and explain the Infinitive. 3. Explain in full the use of ὥφελον in the expression of a wish, and illustrate by examples.

## V.

1. What consonants are called *labials*, what *linguals*, and what *palatals*? Explain *N movable*, and give an example. 2. Accent the following Nouns, γινωμαι, γινωμεν, γινωμαις (from

Nom. γνώμη); παῖδος, παῖδα, παιδων, παισιν (from παῖς); and the following Verbs, βουλευει, βουλευοι, βουλευσασθαι, ελθειν, ελθων. 3. Decline the Noun θάλασσα, and the Adjective χαρίεις. 4. Compare καλός, σάφρων, and ἡδύς. 5. Decline the Relative ὅς in the Singular, and οὗτος in the Plural. 6. How is the Future Passive formed?—give an example (from βουλεύω). How is the Future Active of a liquid Verb formed? 7. Give a synopsis of the Second Aorist Passive of λείπω, and inflect the Subjunctive of that tense. Inflect the Aorist Imperative Active of βουλεύω, and the Present Optative Active of δίδωμι. 8. Where are βουλευθῇ, βουλευθῆναι, and τέτριψαι made? Explain the euphonic change introduced in forming τέτριψαι. 9. What is the difference between βουλεύσαι and βούλευσαι?—between ἔστησα and ἔστην? 10. Translate βούλεσθε εἶναι σοφοί, and βούλεσθε τούτους γενέσθαι σοφοίς. Explain the case of the Adjective in each. 11. Translate μέλει σοι τούτων, and explain the cases of the Pronouns. 12. Describe the Iambic Trimeter Acatalectic. What is a Trochee, a Pyrrhic, an Anapaest, and a Cretic?

SOPHOMORE QUESTIONS.—1. In what constructions can the Future Optative be used? Give an example of its correct use. 2. What constructions are regularly used in dependent clauses after Verbs signifying *to strive, to take care, to effect*, etc.? 3. What is the meaning of *each tense* of the Infinitive after a verb of *saying or thinking*? How are the tenses that are wanting in the Infinitive supplied? Give an example of each tense, using φημί and ποίω.

## VI.

1. What Nouns of the first declension have the ending *a* of the Nominative Singular *short*? 2. Give the contracted forms *with the Accents* of the Noun πλόω (Nom. Dual), of the Adjective αντίπρος, of the Verb ἔχραεν, and state the rule or exception to which the Accent of each is to be referred. 3. Decline the Noun μνάα. The Noun Θώς. The Adjective πολύς. 4. Into what eight classes are Pronouns divided? Give examples of



each in the Dative Plural. 5. What is the Greek for the numeral *Three* (cardinal), *Third* (ordinal), *Thrice*, *One Third*? 6. Decline εἷς; τρεῖς. 7. What is the Pluperfect Active of ἀγείρω? The Aorist Active of δίδωμι? The Future Perfect Passive of βλάπτω? How is the last formed? 8. Give a synopsis of the Second Perfect of λείπω. Inflect the Future Optative Active of ἀγγέλλω, the Present Optative Passive of τιμάω, the Present Subjunctive Active of δίδωμι. 9. Where is the form ἦς from εἶμι made? Inflect the Second Aorist Middle of τίθημι and the Second Pluperfect of εἶδω. 10. Explain *Attraction* in Relative Sentences, and illustrate by example. 11. Mention any constructions you remember in which the Dative may be used to take the place of the Genitive or Accusative, with or without Prepositions. 12. What cases can be used after the following Prepositions: ἀμφί, ἀνά, διὰ, πρός, ὑπέρ?

SOPHOMORE QUESTIONS. — 1. Give an example of the use of the Imperfect Infinitive. 2. Explain with examples the use of the Secondary Tenses of the Indicative in final clauses after ἵνα, ὥς, etc. 3. The difference in meaning between οὐ μὴ and μὴ οὐ? Give examples of the correct use of each. 4. What Tense of the Infinitive is regularly employed after μέλλειν? What other Tenses may take its place?

## VII.

1. What consonants are called *mutes*, and how are they divided into *smooth*, *middle*, and *rough*? When is a syllable called *pure*? 2. Accent the following Nouns: θαλασσαν, θαλασσαι, θαλασσαν (from θάλασσα); αἰῶνος, αἰῶνων (from αἰών); and the following Verbs: ἐβουλεύον, βουλευοσιν, λῑπεῖν, λῑπεσθαί, λῑπων. Give the rule for the last three. 3. Decline the Adjective ἀξιος. 4. Compare ἀξιος, πῶλῑς, and μέγας. Give the rule for comparing ἀξιος. 5. Give the Genitive Singular (in all genders) of the following pronouns: ἐγώ, αὐτός, ἐκεῖνός, οὗτος, τίς, τις, ὅς, and ὅστις. 6. Give a synopsis of the Aorist Middle of βουλεύω, and inflect the Optative. Give a synopsis of the Second Aorist Middle of λείπω,

and inflect the Imperative. 7. Where are *λίπωσιν*, *λιπῶσιν*, *λιπύνειν*, and *λιπήσουσιν* made? In what places is *δῆλοι* found? Where are *ἴστασαν*, *ἴστασθαι*, and *θεῖτο* made, and from what Verbs? Inflect the Present Imperative Passive of *ἴστημι*. 8. Translate *ἔλαθεν ἑαυτὸν σοφὸς ὢν*, and explain the use of the Participle. Mention any other Verbs which take a Participle in a similar way. 9. Which is more correct, *φοβοῦμαι μὴ ἔλθοι* or *φοβοῦμαι μὴ ἔλθῃ*? Give the reason for your answer. Translate *οὐκ ἂν γένοιτο τοῦτο*, and *μὴ γένοιτο τοῦτο*. Explain the construction in each.

SOPHOMORE QUESTIONS.—1. Translate *φοβοῦμαι μὴ τοῦτο ποιῇ*, and *φοβοῦμαι μὴ τοῦτο ποιεῖ*, and explain the difference in meaning. 2. Translate *εἶπεν ὅτι τοῦτο ποιοῖ*, *εἶπεν ὅτι τοῦτο ποιήσκειν*, *εἶπεν ὅτι τοῦτο ποιήσοι*, and *φησὶ τοῦτο ποιήσαι*. Explain the tense of *ποιέω* used in each. 3. What two meanings can *οὐκ ᾔδει* (from *οἶδα*) *ὃ τι ποιήσκειν* have? Explain the use of the Optative in each.

## VIII.

1. What is Crasis? Give the contracted forms of *καὶ ἄν*, *καὶ εἴαν*. 2. Decline *εἷς*. Accent *βέβουλεν*, *ἴστας*, *ἰδεν*. Give the rules for the accentuation of these words. 3. Decline *τριήρης*, *ἰχθύς*. 4. Decline *εὐγεως*, *πολύς*. Compare *σοφός* and *ἀθηθής*. 5. Decline *αὐτός* and *ὁστος*. 6. Give a synopsis of the Aorist Passive of *βουλεύω*, and inflect the Subjunctive. Inflect the Future Middle of *ἀγγέλλω*. 7. Inflect the Optative Passive of *τιμῶ*. Mention all the places in which the form *τιμᾶσθε* is found. 8. Translate *οὐδὲν ἂν πράξαιμ' ἄν, ὢν οὐ σοὶ φίλος*. Explain *πράξαιμ'* and *ὢν*. 9. Translate *ἦλθεν ἵνα τὰ γεγενημένα ἴδοι*. Explain the Optative. *Εἰ ἔλθοι, ταῦτ' ἂν ἴδοι: εἰ ἦλθε ταῦτ' ἂν εἶδεν*. Translate, and explain the difference.

SOPHOMORE QUESTIONS.—1. Translate *τί μ' οὐ λαβὼν ἔκτεινας εὐθύς, ἵνα ταῦτα μήποτε ἐποίησα*, and explain the construction of *ἐποίησα*. 2. Translate *εἴθε ἐποίηι, εἴθε ποιοῖ*.

## IX.

1. Explain the terms *Contraction*, *Crisis*, and *Elision*. Give an example of *Elision*. 2. Accent the following words: *θαλασσαν*, *θαλασσαι*, *θαλασσων*, *θαλασσαις* (from *θάλασσα*); *ἀξιῶ*, *ἀξιοί*, and *ἀξιων* (from *ἄξιος*); *βουλευοί*, *βουλευονται*, and *βουλευοιτο*. Give the rules for the three verbs. 3. Decline the Noun *λέων* and the Participle *ιστάς*. 4. Compare *χαρίεις*, *ἡδύς*, *μέγας*, and *πολύς*. 5. Decline the Numeral *εἰς* and the Pronoun *οὗτος*. 6. How do you form the Future *Passive* and the Future *Middle*? What is the Future *Active* of *ἀγγέλλω*, and by what rule is it formed? 7. Inflect the Imperfect *Passive* of *βουλεύω*, and the Imperfect *Active* of *δίδωμι*. Give a *synopsis* of the Present Tense of *εἰμί*, and inflect the Optative. 8. Where are the following verbs made: *βουλευσάτω*, *βουλευθείη*, *βουλευθήτω*, and *ᾶμεν*, *ῆμεν*, *ἔσται*? 9. How are the *gender*, *number*, and *case* of a Relative Pronoun determined? Give an example. 10. Translate *ἐξίεναι ἐξ ὧν ἔχομεν*, and explain the case of the Relative. Translate *σὺν ᾗ ἔχεις δυνάμει*, and explain the position of *δυνάμει* and the case of *ᾗ*. 11. Explain the Genitive and the Accusative Absolute, and give an example of each.

SOPHOMORE QUESTIONS. — 1. Explain the division of tenses into *primary* and *secondary*. How is the construction of a dependent sentence affected by this principle? 2. What *time* is denoted by the Aorist Infinitive? Give examples, using *ελθεῖν*. 3. Translate *εἶπεν ὅτι τοῦτο ποιοῖ*, *εἶπεν ὅτι τοῦτο ποιήσκειν*, and *εἶπεν ὅτι τοῦτο ποιήσοι*, and explain the difference in meaning. 4. Describe the *Iambic Trimeter Acatalectic*. What are the four feet of *two* syllables?

## X.

1. Accent the following words, and give the rules for the accentuation you adopt:—*τιθεῖς*, *φαγεῖν*, *λαβου*, *ισταντο*, *προσειχον*, *βη*. 2. Decline *Ἑρμῆας*, *νῆσος*, *νεώς*, *κέρας*, *Περικλῆης*. 3. Give the Accusative of *ἰχθύς*, *ναῦς*, *βοῦς*, *γίγας*, *Σωκράτης*, *βασιλεύς*. 4. Decline *ἡσυχος*, *δεικνύς*, *ἴδρις*. 5. Compare *καλός*, *μέσος*, *μικρός*, *πρέσβυς*.

6. Decline *σύν*, *ἔς*. 7. Give the *ordinals* from one to ten inclusive. Decline *δύο*. 8. Give the synopsis of the Second Perfect of *λείπω*. Inflect the Second Aorist Active and the Second Aorist Passive of the same verb. 9. Give the Perfect of *ἔμνημι*. Explain the *Augment*. Give the Pluperfect of *περιγράφω*. 10. Inflect the Present Optative, Active, and Passive of *δηλώ*. 11. What is the construction after verbs of accusing? After verbs of taking away? After verbs denoting fulness and want? 12. Translate *ἐθέλω χρῆσθαι οἷς ἔχεις*, and explain the construction of *οἷς*.

SOPHOMORE QUESTIONS. — 1. When do the Present and Aorist Infinitive retain their time? What is the rule for the *time* of Participles? 2. How is an indefinite general relative sentence expressed after primary and after secondary tenses? 3. How do you express a wish referring to the Past? To the Present? To the Future? 4. In what case do you put the *object* after *verbals*? How do you express the *agent* after the same class of words?

## XI.

1. What consonants are called *liquids*? What are the *mutes*, and how are they divided into *smooth*, *middle*, and *rough mutes*? 2. Explain the following euphonic changes: that of the root *λεγ-* in *ἐλέχθην* and *λέλεκται*, that of the root *λειπ-* in *λέλειμμαι* and *ἐλείφθην*, and that of *πειθ-* in *πέπεισμαι*. 3. Accent the following words: *γνωμην*, *γνωμαι*, *γνωμων* (from *γνώμη*); *πολεως* and *πολεις* (from *πόλις*); *οἰτινος* and *οὔστινας* (from *δοτις*); and *βουλευει*, *βουλευοι*, and *βουλευωμαι* (from *βουλεύω*). Give the rules for the three verbs. 4. Decline the Nouns *δέξα* and *πράγμα*, and the Pronouns *ἐγώ* and *οὗτος*. Give the Accusative Singular and the Accusative Plural of the Relative *ὅς*. 5. Inflect the Future Indicative Active and the Aorist Subjunctive Active of *βουλεύω*. Give a synopsis of the Indicative Passive of *βουλεύω*, and inflect the Aorist. 6. Give a synopsis of the Second Aorist Passive of *λείπω*, and inflect the Subjunctive. 7. Give a synopsis of the

Second Aorist Active of *δίδωμι*; and inflect the Indicative and Subjunctive. 8. In what voice, mood, and tense are the following verbs : *ἔθεσαν*, *ιστάναι*, *ἴωσι*, *λέναι*, and *ἤδεσαν*? 9. How does the Enclitic *τις* differ from *τίς*? Translate *ἀκούεις τι*; and *τί ἀκούεις*; what is the difference between *ἡ αὐτὴ πόλις*, — *αὐτὴ ἡ πόλις*, — and *αὐτὴ ἡ πόλις*? 10. Explain the distinction between Primary and Secondary Tenses. Explain the terms *protasis* and *apodosis*, and give an example of each. 11. What are the Spondee, the Trochee, the Iambus, the Dactyl, and the Anapest? What is the composition of Dactylic Hexameter (Heroic), and that of the Elegiac Pentameter?

SOPHOMORE QUESTIONS. — 1. Translate *εἶπον ὅτι ἔλθοι*, — *εἰ ἔλθοι, ἴδοι ἂν τοῦτο*, — and *ὅποτε ἔλθοι, τοῦτο ἐποίει*. Explain the time to which *ἔλθοι* refers in each case. 2. When are *ἴνα*, *ὅπως*, &c., followed by the Subjunctive, when by the Optative, and when by the past tenses of the Indicative? After what class of verbs is *ὅπως* with the Future Indicative most frequently used? 3. Describe the Iambic Trimeter Acatalectic, stating all the substitutions allowed, and showing how the Comic Trimeter differs from the Tragic.

## XII.

1. Divide the consonants of the Greek alphabet into labials, linguals, and palatals. What change does *γ* undergo when it precedes a labial, lingual, or liquid? 2. Accent the following words, and give the rule for each : *λεγονται*, *τιμησαι*, *οἰκοι*, *οὐς* from *οὐας*. 3. Decline the Nouns *οἰκία*, *νεώς*, and *ἄστρο*, and the Pronouns *ἐγώ* and *δοτις*. 4. Give the synopsis of the Aorist Passive of *βουλεύω* in all the Moods, and inflect the Participle. Inflect the Perfect Imperative Passive. 5. Give a synopsis of the Second Aorist Passive of *λείπω*, and inflect the Subjunctive. 6. Inflect the Present Optative Passive of *τιμῶ*, *ἴστημι*, and *δίδωμι*. 7. Give a synopsis of the Present of *τίθημι*, and inflect the Second Aorist Subjunctive Active. 8. Explain the apparent irregularity in the syntax of the following sentences : *πᾶσι*

ἐγὼ καὶ οὗτος, ταῦτα ἐγένετο, τὸ στράτευμα μάχονται. 9. Translate οἱ ἀγαθοὶ ἄνθρωποι, ἀγαθοὶ οἱ ἄνθρωποι, and οἱ ἀγαθοὶ τῶν ἀνθρώπων, and explain the Genitive. 10. Translate πέμπει τοὺς ἀνθρώπους and πέμπει τῶν ἀνθρώπων, βουλευὼν τιμᾶται, and ὁ βουλευόμενος τιμᾶται.

SOPHOMORE QUESTIONS. — 1. Translate εἰ ἔπραξε καλῶς ἔσχεν and εἰ ἔπραξε καλῶς ἂν ἔσχεν. Translate εἰ πράττει καλῶς ἔχει and εἰν πράττει καλῶς ἔχει. 2. Translate φοβοῦμαι μὴ γίγνεται and φοβέσθαι μὴ αὐ γίγηται. If the leading verb in these cases were secondary, what would be the form of the dependent verbs? 3. Give examples of the use of the Infinitive in Indirect Quotation to express an action which is past, present, or future with respect to the leading verb.

## XIII.

1. Write more correctly ἔστ' ὅπως, — ἀπ' οὗ, — οὐκ ὑμῖς, and explain the principle. What is *N movable*? — give an example of its use. 2. Explain the terms *oxytone*, *barytone*, *perispomenon*. Give the general rule for the accent of *Nouns*. Accent μουσης, μουσαν, μουσων, μουσαι, μουσαις. 3. Decline the Substantive λέων, and the Adjective ἀληθής. Compare ἀξιος, ἀγαθός, κακός, and μέγας. 4. Decline ἐγώ, and the Numeral εἰς. 5. Give a synopsis (through all the moods) of the Aorist Passive of βουλεύω, and inflect the *Optative*. Give a synopsis of the Second Aorist Middle of τίθημι, and inflect the *Imperative*. 6. Give the voice, mood, and tense of λίσσωσι, λιπῶσι, βούλευσαι, and βουλεύσαι. 7. Give the rule for the formation of the Perfect Passive, the Future Passive, and the Future Active. What is the Future Active of μένω and of ἀγγέλλω? 8. What are the two kinds of *Augment*, and when is each used? Give an example of each. What is the ordinary Reduplication, and what is the *Attic* Reduplication? 9. Inflect the Imperative Active of τιμάω, giving both the uncontracted and the contracted forms. Inflect the Present Indicative Active of πλέω in the same way.

SOPHOMORE QUESTIONS. — 1. Explain the *three* uses of the

Present Infinitive, and the *two* uses of the Aorist Infinitive; and give an example of each, using ποιεῖν and ποιῆσαι. 2. How many meanings can ἔφη ποιεῖν ἂν τοῦτο and ἔφη ποιῆσαι ἂν τοῦτο have? Explain each use of the Infinitive. 3. Show the difference between a *final* clause and an *object* clause after ὅπως, and give examples. 4. In what cases is the Subjunctive used in Protasis, and what is the corresponding construction in Relative Sentences? Give an example of each. 5. Translate εἶπεν ὅτι τοῦτο ποιοίη, — εἶπεν ὅτι τοῦτο ποιήσεις, — εἶπεν ὅτι τοῦτο ποιήσοι, — εἶπεν ὅτι τοῦτο ποιήσεις ἂν, and explain each tense of the Optative.

## XIV.

1. Decline the Nouns γνώμη and τεῖχος. Explain the change of accent where it is not the same as in the Nominative Singular. 2. Decline the Adjective ἄξιος in the Singular. Compare ἡδύς, πολὺς, and χαρίεις. 3. Decline the Pronouns ἐγώ and οὗτος. 4. Give the principal parts of ἀκούω, λαμβάνω, and ἀπογράφω. Inflect the Aorist Indicative Middle of βουλεύω, and give a synopsis of that tense through all the moods. 5. Give a synopsis of the tenses of the Indicative Active of ἵστημι (in the first person). Give a synopsis of the Second Aorist Active of δίδωμι, and inflect the Optative. 6. Inflect the Perfect Indicative Passive λείπειμαι (from λείπω), and explain the euphonic changes which the root λειπ- undergoes in that tense. 7. What is the difference between ὁ αὐτὸς ἀνὴρ and ὁ ἀνὴρ αὐτός? 8. In the phrase ἐκ τούτων ὧν λέγει, explain the case of ὧν, and give the rule. 9. What are Enclitics, and what are Proclitics? Give examples of each in connection with other words. 10. What are the feet consisting of *two* syllables? Give the quantity of each.

SOPHOMORE QUESTIONS. — 1. To what *time* does the Aorist Optative refer in each of its uses? Give an example of each, using ποιέω. 2. Give the general rule for indirect quotation after ὅτι or ὥς, and examples. 3. Translate εἰ βούλοιο, τοῦτ'

ἐποίει, and εἰ βούλοιο, τοῦτ' ἂν ποιήη, and explain the two uses of the Optative. 4. Which is more correct, μὴ τοῦτο ποιήσης or μὴ τοῦτο ποιήσῃ; Explain the reason, and give the rule for Prohibitions.

## XV.

1. Write more correctly ἔστι οἱ, οὕτως σφόδρα, πέπλεκμαι, ἐνφανής. What are τυχεῖν, δίκη, γέ, called with respect to accent? 2. Write the Genitive and Accusative Singular of the nouns χαρά, δόξα, τελώνης, θῶς. Decline βασιλεύς in the Singular, and τεῖχος in the Plural number. 3. Write the Dative Singular and Plural of the Adjective χαρίεις and of the Participle διδούς in all genders. Compare the Adjectives πολὺς, σεμνός, ταχύς. 4. Decline οὗτος and the interrogative τίς. 5. Inflect the Future Middle Indicative of ἀγγέλλω, and the Imperative Active of τιμάω. 6. Give a synopsis (through all the moods) of the Second Aorist Active of ἵστημι, of the Present Middle of τίθημι, and the Perfect Passive of βουλεύω. 7. State the tense, mood, voice, and Present Indicative of the following verbal forms, γένοιτο, στήσαι, ἔθετο, βούλευσον, ἐφίλει. 8. Translate τὴν αὐτὴν γνώμην (opinion) ἡμῖν ἔχουσιν, and explain the case of ἡμῖν.

SOPHOMORE QUESTIONS.—1. Translate εἰ βούληται, ποιεῖ τοῦτο, and εἰ βούληται, ποιήσει τοῦτο, and explain the two uses of the Subjunctive. 2. Translate φασὶν ἡμᾶς εἰλεῖν, and κελεύουσιν ἡμᾶς εἰλεῖν, and explain the two uses of the Infinitive. 3. What is the rule for mood and tense in indirect quotations with ὅτι or ὡς after verbs of saying. Give examples. 4. How is a purpose expressed in Greek, and how a result? Give examples.

## XVI.

1. Explain the form of the preposition ἐφ' ὑμῖν. What must be the quantity of the α in σῶμα, and why? When is a word called barytone? Accent χαράς as Genitive Singular and as Accusative Plural from χαρά. 2. Write the Genitive and Accusative Singular of the Nouns οἰκία, μούσα, and the



Genitive and Vocative Singular of *στρατιώτης*. Decline *ἰχθύς* in the Singular and *νεώς* in the Plural number. 3. Decline the Adjectives *ἀληθής*, *ἡδίων*. Compare *μικρός*, *μέλας*, *σοφός*. 4. Decline *σύ*, *οὗτος*, and the Masculine Singular of *ὅστις*. 5. Give a synopsis of the Future Active of *μένω*, of the Second Aorist Active of *τίθημι*, and of the Present Middle of *δίδωμι*. 6. Inflect the Imperfect Middle of *φιλέω*, and the Aorist Middle Indicative of *βουλεύω*. 7. State the tense, mood, voice, and Present Indicative First Singular of the following verbal forms: *λιπῶ*, *νομῶ*, *ἐτίψω*, *ἔστω*. 8. Translate *τὴν αὐτὴν γνώμην* (opinion) *ἡμῖν ἔχουσιν*, and explain the case of *ἡμῖν*.

SOPHOMORE QUESTIONS. — 1. When is the subject of the Infinitive Mood regularly omitted? When does the Aorist Infinitive refer to past time relatively? When does *ὅτι* or *ὥς* take the Optative Mood?—give examples. 2. By what mood and tense is a supposition referring to past time, and represented as contrary to fact, expressed? Give an example. 3. Translate *ἦλθεν ἵνα ἰδῇ*. What might be substituted for *ἰδῇ*, and which would be the more regular form?

## XVII.

1. Define an *Enclitic*. Give the Enclitics which you remember. State the quantity of the *a* in the following words, and give the rules: *δόξα* (Nom. Sing.), *δόξας* (Acc.), *ἐλπίδας*. What must be the quantity of the *a* in *σῶμα*, and why? 2. Decline the Nouns *πρᾶγμα*, *χώρα*, *γῆψ*, *νεώς*, in the Singular, and *τριήρης*, *ἄστυ*, in the Plural. What exceptions to the usual rules for Accent occur among the forms here required? 3. Decline the Pronouns *οὗτος* and *ὅστις*. Decline in the Singular the Participle *βεβουλευκώς* and the Adjective *γλυκίς*. Compare *γλυκίς* and *ἡδύς*, and decline the Comparative of the latter in the Plural. 4. Inflect the Imperfect Active and the Present Optative Middle of *τιμάω*, writing both uncontracted and contracted forms. Give synopses of the Aorist Active Middle and Passive of *βουλεύω*

through all the moods. 5. Where are ἀγγελῶ, ἔστω, στῶ, εἰλύω, ληφθῶ, formed (i. e. tense, mood, voice), and from what verbs? Inflect the first and the last. 6. Translate ἡ αὐτὴ γυνή, — αὐτὴ ἡ γυνή, — ἡ γυνὴ αὐτή, writing the Greek with the English.

SOPHOMORE QUESTIONS. — 1. Translate ἔφη τοῦτο ποιῆσαι, and ἔφη τοῦτο ποιήσῃ. Substitute εἶπεν ὅτι for ἔφη, and make the requisite changes in ποιῆσαι and ποιήσῃ. 2. Translate ὅστις ἂν ἔλθῃ, ὁψεται, — ὅστις ἔλθεν, εἶδεν ἂν. To what kind of sentences are these relative clauses analogous? Explain the two uses of the adverb ἂν illustrated above. 3. How is a Purpose expressed in Greek? How a Wish referring to Future Time? How a Prohibition in the Second Person?

### XVIII.

1. Write more correctly Βάχχος τέτριβμαι, νύκτ' ἄλην, οὕτως φησί. What is *Crasis*? Give an example. Mark the quantity of the final syllables in the following words: δόξα (Nom. Sing.), δόξα (Nom. Dual), κριτάς (Acc. Pl.), λιμένας (Acc. Pl.), λύσας (Part.). 2. Decline the Nouns Πέρσης, πόλις, τεῖχος, κέρας, in the Singular, and βασιλεὺς, ἀνώγειν, in the Plural. 3. Decline the Pronouns οὗ (ἴ) and τῆς. Decline the Numeral εἷς, and in the Plural the Adjectives πᾶς and πρῶτος. What exceptions to the regular rules for Accent occur among the forms here required? 4. Compare σάφρων, τάλας, ἀγαθός, and decline one of the Comparatives of the last in the Plural. 5. Inflect the Present Optative Active of τιμάω, and the Imperfect Middle of δίδωμι. Give synopses of the Future Middle of κτείνω, and of the Second Aorist Active of τίθημι through all the moods. 6. Where are λίπω, λιπῶ, ἐλῶ, ἔλω, ἐκρίνω, formed (i. e. tense, mood, voice), and from what verbs? Give synopses of the first and last.

SOPHOMORE QUESTIONS. — 1. Translate ἔφη καλῶς ἂν πράξει in two ways, showing what two forms in Direct Discourse are here represented. 2. Translate λέγει ἐὰν δόξῃ αὐτῷ, — λέξει ἐὰν δόξῃ αὐτῷ, and explain the two uses of the Subjunctive. 3. Trans-

late *ὅστις εἶδεν, ἐχάρη αὖν*, and explain the meaning of the relative sentence. What would be the meaning, if the verbs were changed to the Optative of the same tense? What negative particle would be proper with the first verb? Describe two classes of Relative Sentences.

## XIX.

1. Give an example of Elision. In what words does the accent of the elided vowel disappear with the vowel? What is the word *τέ* called with respect to accent? Give the other words of the same sort. Write *τινός* after *ἀνθρώπου* with the accents properly disposed. Write *τέ* after *σῶμα*. 2. Decline *πόλις*, *Σκύθης*, *οἰκία*, *ὁστέον* in the Singular, and *σύκον*, *νεός*, *θώς*, *τριήρης* in the Dual and Plural. Give the Genitive, Dative, and Accusative in all genders and numbers of *ἄξιος*, *γλυκύς*, of the Present Active Participle of *ἵστημι*, and of the Perfect Active Participle of *βουλεύω* (or *παύω*). 3. Compare *σοφός*, *τάλας*, *ἀληθής*, *πολύς*. Decline the Comparative of *μέγας*. Form an adverb from *ἡδύς*, and compare it. Decline *σύ* in the Dual and Plural and *οὗτος* in the Singular. Give the Cardinal Numerals as far as twelve. 4. Give synopses (through all the moods) of the Aorist Middle and Aorist Passive of *βουλεύω* (or *παύω*), and inflect the Imperative. Give synopses of the Perfect Passive of *πλέκω* and the Present Active of *δίδωμι*. Inflect the Perfect Passive Indicative of *πλέκω* and the Imperfect Passive of *τιμάω*. 5. Where are *μενώ*, *ἐπαύσω*, *λιπῶ*, *στῶ*, *ἴω*, and *εἰδίδω* formed (i. e. tense, mood, voice), and from what verbs?

SOPHOMORE QUESTIONS. — 1. What is the construction in Object Clauses after verbs of *striving*? How do such clauses differ from Pure Final Clauses? What is a General Supposition? How are General Suppositions expressed? How are Prohibitions in the Second and Third Persons expressed in Greek? Translate *ἔφη δώσειν εἰ δύναιτο*, and state what form the last three words would have in the Direct Discourse.

## XX.

1. Give an example of Crasis. When does Iota become subscript in Crasis? Write *τέ* after *κέρας* with the accents properly disposed. Write *εἰμί* after *Κῦρος*. What is *ὤς* called with respect to accent? 2. Decline *βασιλεύς*, *δεσπότης*, *χώρα*, *κέρας* in the Singular, and *ἀνώγειν*, *ἰχθύς*, *ἄστυ* in the Dual and Plural. Give the Genitive, Dative, and Accusative, in all genders and numbers, of *χαρίεις* and *ἀληθής*, of the Second Aorist Active Participle of *δίδωμι*, and of the Perfect Active Participle of *βουλεύω* (or *παύω*). 3. Compare *ἄξιος*, *μέλας*, *σώφρων*, *μέγας*. Decline the Comparative of *ἡδύς*. Form an adverb from *ταχύς*, and compare it. Decline *ἐγώ*, *ὅστις*, *οὗτος* in the Dual and Plural. 4. Give synopses (through all the moods) of the Aorist Middle of *βουλεύω* and the Present Passive of *τιμάω* and *ἴστημι*. Inflect the Future Optative Active of *ἀγγέλλω* and the Perfect Passive Indicative of *τρίβω*. 5. Where are *εἰδῶ*, *ἔστω*, *ἐπαύσω*, *ἴω*, *λίπω*, *λιπῶ*, *ἐτιμῶ*, and *ἐδίδω* formed (i. e. tense, mood, voice), and from what verbs?

SOPHOMORE QUESTIONS. — 1. Translate *εἰ τοῦτο ποιεῖν δύναται*, *ποιεῖ*, and *ἐὰν τοῦτο ποιεῖν δύνηται*, *ποιεῖ*, and explain the two sorts of Conditional Sentences. How would the latter be written if *ποιεῖ* were changed to *ἐποίει*? Describe two classes of Relative Sentences. 2. What is the construction in Greek after verbs of *fearing*? after verbs of *hindering*? Give the general rule for the Indirect Quotation of compound sentences after *ὅτι* or *ὥς*. Translate *χαλεπὸν εὐρεῖν* and *φησὶν εὐρεῖν*, and explain the two distinct uses of the Infinitive.

## XXI.

1. Decline *κριτής*, *πόλις*, and the Singular of *νήσος*. Explain the accent of the Nominative and Genitive Singular and the Nominative Plural of *νήσος*. 2. Decline the Adjective *χρύσεος* in the Singular of all genders, and *πᾶς* in the Plural. Compare *σοφός*, *ἡδύς*, and *μέγας*; and the Adverb *σοφῶς*. 3. Decline the

Pronouns ἐγώ and σύ in the Plural, — οὗ in all numbers, and οὗτος in the Plural. Explain the accent of οἶδε and οἶσσι. 4. Give a synopsis of the Future and Aorist Middle of βουλεύω (in all the moods), and inflect the Optative of each. Give a synopsis of the Second Aorist Passive of λείπω, and inflect the Subjunctive. Inflect the Perfect Passive Indicative of λείπω, and explain the euphonic changes. 5. Give a synopsis of the Second Aorist Active of δίδωμι, and of the Second Aorist Middle of τίθημι, and inflect the Indicative of each. 6. Translate ἐκ τῶν πόλεων ὧν ἐτύγγαεν ἔχων, and explain the case of ὧν and the construction of ἔχων. 7. Give rules for the *position* of the Article, (1) with a noun and an adjective, (2) with a noun and a demonstrative pronoun, (3) with αὐτός. Give an example of each, and translate it. 8. Give the *names* and mark the *quantity* of the feet of *two* syllables.

SOPHOMORE QUESTIONS. — 1. Explain the ordinary difference between the Subjunctive and the Future Indicative after ὅπως, and give an example of each. 2. Translate εἰ δύναιτο, τοῦτο ἐποίει, and εἰ δύναιτο, τοῦτ' ἂν ποιοίη, and explain the two uses of the Optative. Explain the two corresponding uses of the Subjunctive, and give examples. 3. What various constructions follow πρὶν? give examples. Is τοῦτο ποιήσω πρὶν ἂν ἔλθω or τοῦτο ποιήσω πρὶν ἔλθειν more correct? — and why?

## XXII.

1. What consonants are called *liquids*? How are *mutes* divided into *labial*, *palatal*, and *lingual* mutes? 2. Form the Future of τρίβω, γράφω, and πείθω, and explain the euphonic changes which are made before the ending -σω. 3. Inflect the Perfect Passive (τέτριμμαι) of τρίβω, and explain the euphonic changes made in adding the endings -μαι, -σαι, -ται, -σθον, and -σθε to the stem τριβ-. 4. Decline the Nouns πολίτης and νῆσος in the Singular, and λίων and βασιλεῖς in the Dual and Plural. Give the Accusative Singular of ἔρις, ἐλπίς, πόλις, and ναῦς; and

give a rule for each case. 5. Decline the Pronouns *σύ* and *ὅστις*. 6. Give a synopsis (through all the moods and participles) of the Future Passive of *λύω* (or *βουλεύω*). Give a synopsis of the Second Aorist Middle of *λείπω*, and inflect the Indicative and Imperative. 7. Give a synopsis of the Second Aorist Middle of *τίθημι*, and inflect the Optative. Give the Principal Parts of *ἵστημι* and *δίδωμι*. 8. What is the difference between the use of the Article in Attic Greek and in Homer? Give a rule for the *position* of the article with adjectives and with demonstrative pronouns, and give an example of each. 9. Which tenses of the Indicative are *primary*? and which are *secondary* (or *historical*)? How does this distinction often affect the mood of a dependent verb? 10. What is the difference between the Imperfect and Aorist Indicative? and between the Present and Aorist Subjunctive?

SOPHOMORE QUESTIONS. — 1. Explain the principle of *Indirect Quotations*, as regards both the leading and the dependent verbs. When can the Subjunctive be used in *Indirect Questions* in Greek? Give an example. 2. Explain the analogy between *relative* sentences and *conditional* sentences, and give examples. 3. What form of the Infinitive construction can follow verbs denoting *hindrance* or *prevention* (like *εἴρω*, to *prevent*)? Give examples.

## XXIII.

1. Correct the form *γεγραφμαι*, and form the Second and Third Persons Singular of it. Perform the operations of Crasis and Elision on the words *μήτε ὁ ἀνὴρ*. 2. Decline in the Singular *θάλασσα*, *δεσπότης*, *θρίξ*, and *δορυ*, and in the Plural *τρήρης*. 3. Decline the Pronouns *σύ* in all numbers, *οὗτος* and *ὅστις* in the Singular. Decline *ἡδύς* in the Plural. Compare *σοφός*, *μέλας*, *κακός*, and *ῥάδιος*. 4. Inflect the Aorist Subjunctive Passive of *τιμάω*, the Present Indicative of *εἶμι*, the Second Perfect *οἶδα* in the Indicative. 5. Write the Perfect of *ἀκούω*, the Future and Aorist of *δίδωμι*, the Second Aorist of *ἐκμανθάνω* and of *ἀποθνήσκω*, — *all in the Active Voice*. 6. How do *ὁ ἀνὴρ ἀγαθός* and

ὁ ἀγαθὸς ἀνὴρ differ in meaning? How is a Wish referring to future time expressed? 7. Write out the scheme of the Dactylic Hexameter Verse.

SOPHOMORE QUESTIONS. — 1. What is the difference in meaning between ἐβασίλευον and ἐβασίλευσα? Give the different constructions in use after ἵνα in Final Clauses. How do Final and Object Clauses differ in meaning? 2. How do εἴ τις τις ἴδοι, οὐδὲν ἂν εἴποι and εἴ τις τις ἴδοι, οὐδὲν ἔλεγεν differ in sense and grammar? What form of Direct Discourse is represented by ἔλεγεν ὅτι γράψειεν? How do you express a Wish referring to past time? Write out the scheme of the Iambic Trimeter Acatalectic.

#### XXIV.

1. Explain Elision and Crasis; give examples in ἐπὶ ἐτέρῳ and καὶ αὐτός. 2. What are Enclitics? Correct the accent of οὗτος ἐστίν, τιμαὶ τέ, τιμῶν τέ, τούτου γέ. 3. Decline the Nouns νῆσος, λέων, and βασιλεύς throughout, and ἀνὴρ in the Singular. 4. Decline the Adjective γλυκὺς. Compare σεμνός, ὀξύς, and ἀληθής. 5. Give the synopsis of the Future Passive of λύω (or βουλεύω) through all the moods, and inflect the Indicative. Inflect the Present Indicative Passive of δηλόω (in the contract form). In what places in this verb is the form δηλοῖ found? 6. Give the synopsis of the Second Aorist Middle of τίθημι in all the moods, and inflect the Optative. Inflect the Imperfect of εἶμι (to go). 7. State briefly the distinction in the uses of the adverb ἄν.

SOPHOMORE QUESTIONS. — 1. Explain the analogy between the expression of a Wish and of a Condition. What are the constructions which may follow expressions denoting hindrance? What are the two uses of an Aorist Infinitive? Translate "He does this whenever he pleases," and "He did this whenever he pleased." 2. What are the differences between the Homeric use of the Article and the Attic use? 3. What varieties of verse are measured by Dipodies? Explain the substitutions in the Iambic Dipody. How does the Trochaic Dipody differ from this?

## XXV.

1. Write down the *smooth mutes*; the *labial mutes*. Perform Crasis and Elision on μήτε ὁ ἀνὴρ. 2. Form the Accusative Plural of τιμή, Vocative Singular of πολίτης, entire Singular uncontracted and contracted of δαστέον, Singular in all cases of βασιλεύς, Nominative Plural and Genitive Plural of σῶμα and πόλις. 3. Decline ἀληθής in the Singular. Compare ἀγαθός and κακός. Decline σύ in all its numbers, and ὅστις in Masculine Singular. 4. Form the Second Person Singular, Aorist Imperative Middle of βουλεύω. Form the First Person Singular of λύω in Aorist Optative Passive,\* of φεύγω in Second Aorist Subjunctive Active, of λείπω in Second Aorist Middle. Form the Second Person Singular of τίθημι in Second Aorist Indicative Middle. Inflect εἶμι (*I go*) in the Present Indicative. Write out the Principal Parts of γινώσκω and ἐκδίδωμι. 5. How is the Article used in Homer? What is the difference between καλὸς ὁ παῖς and ὁ καλὸς παῖς? Σοφώτερός ἐστιν ἢ ἐγώ; express this by changing ἐγώ into an oblique case. What constructions are used in Final Clauses? How do you express a General Supposition in present and in past time? What is a Dactyl, an Iambus, a Trochee, an Anapæst?

SOPHOMORE QUESTIONS. — 1. Explain the use of ἵνα with the past tenses of the Indicative. Explain the Accusative in μάχην νικᾶν. Express “that man” in Greek prose. What constructions are allowed with verbals in -τέος, -τέον? What tenses and moods are used to express Prohibition? Write out the scheme of the Iambic Trimeter Acatalectic both of Tragedy and of Comedy, naming the feet employed.

## XXVI.

1. State the general principle for the Accent of Verbs, with such exceptions as you remember. 2. Decline the Nouns Μοῦσα, τεῖχος, and θυγάτηρ; the Singular of φλέψ, and the Plural of



λέων. 3. Decline the Pronouns *σύ* and *τις*, and the Numeral *εἷς*. 4. Compare *ταχύς*, *αἰσχροῦς*, and *κακός*, and decline one of the Comparatives of the last in the Plural. 5. Inflect the Present Optative Middle of *τιμάω*, and the Imperfect Middle of *τίθημι*. Give a synopsis of the Present Active of *δηλόω*, and of the Aorist Passive of *ἵστημι*. 6. If in the sentence *ἔρχεται ἵνα τὴν πόλιν ἴδῃ* the first verb should be changed to *ἦλθεν*, how would you construct the dependent verb? 7. Translate into Greek the following: *I saw those who were present, and I say that I have seen them.*

SOPHOMORE QUESTIONS. — 1. Translate *ἔφη καλῶς ἂν πράξει* in two ways, showing what two forms in Direct Discourse are represented. 2. Translate *ὅστις εἶδεν, ἐχάρη αὖν*, and explain the meaning of the relative sentence. What negative particle would be proper with the first verb? 3. Under what circumstances is a secondary tense of the Indicative used in a Final Clause after *ἵνα*?

## LATIN COMPOSITION.

## I.

1. Demaratus, the father of King Tarquin,<sup>1</sup> fled<sup>2</sup> from Corinth to Tarquinii.

1. *Tarquinius*. 2. *Fugio, fugere*.

2. I do not think<sup>1</sup> that immortality<sup>2</sup> is to be despised<sup>3</sup> by a mortal<sup>4</sup>

1. *Arbitror, arbitrari*. 2. *Immortalitas*. 3. *Contemno, contemnere*. 4. *Mortalis, -e*.

3. Theophrastus is<sup>1</sup> said to have accused<sup>2</sup> Nature, because<sup>3</sup> she had given a long life to crows,<sup>4</sup> and so<sup>5</sup> short<sup>6</sup> a life to men.

1. *Dico, dicere*. 2. *Accuso, accusare*. 3. *Quod*. 4. *Cor-nix*. 5. *Tam*. 6. *Exiguus*.

4. Ignorance<sup>1</sup> of future<sup>2</sup> evils<sup>3</sup> is more useful<sup>4</sup> than knowledge<sup>5</sup> [of them<sup>6</sup>].

1. *Ignoratio*. 2. *Futurus*. 3. *Malum*. 4. *Utilis*. 5. *Scientia*. 6. *Omit*.

5. Do you not know<sup>1</sup> what<sup>2</sup> sort of men you charge<sup>3</sup> with crime?<sup>4</sup>

1. *Intelligo*. 2. What sort of = *qualis*. 3. *Arguo, arguere*. 4. *Scelus*.

6. If death<sup>1</sup> were feared,<sup>2</sup> Brutus would not have fallen<sup>3</sup> in battle,<sup>4</sup> and the Decii would not have exposed<sup>5</sup> themselves to the weapons<sup>6</sup> of the enemy.

1. *Mors*. 2. *Timeo, timere*. 3. *Concido, concidere*. 4. *Prælium*. 5. *Objicio, objicere*. 6. *Telum*.

## II.

1. Pompey was the first Roman who subdued<sup>1</sup> the Jews.<sup>2</sup> By right<sup>3</sup> of conquest<sup>4</sup> he entered<sup>5</sup> their Temple.

1. *Devinco, -ere.* 2. *Judæus.* 3. *Jus.* 4. *Victoria.*  
5. *Intro, -are.*

2. They say<sup>1</sup> that Timotheus, a distinguished<sup>2</sup> man at Athens,<sup>3</sup> when<sup>4</sup> he had dined<sup>5</sup> at<sup>6</sup> Plato's<sup>7</sup> and had been greatly<sup>8</sup> gratified<sup>9</sup> with the entertainment,<sup>10</sup> and had seen him the-next-day,<sup>11</sup> said:<sup>12</sup> "Your dinners<sup>13</sup> are pleasant<sup>14</sup> not only at-the-time,<sup>15</sup> but also the-day-after."<sup>16</sup>

1. *Fero, ferre.* 2. *Clarus.* 3. *Athenæ, -arum.* 4. *Cum.*  
5. *Cæno, -are.* 6. *Apud.* 7. *Plato, -onis.* 8. *Admodum.*  
9. *Delecto, -are.* 10. *Convivium.* 11. *Postridie.* 12. *Dico.*  
13. *Cæna.* 14. *Jucundus.* 15. *In præsentia.* 16. *Postero die.*

3. Verres also<sup>1</sup> ordered<sup>2</sup> the silver<sup>3</sup> tables<sup>4</sup> to be carried-away<sup>5</sup> from<sup>6</sup> all the shrines.<sup>7</sup>

1. *Idem.* 2. *Jubeo, -ere.* 3. *Argenteus, -a, -um.* 4. *Mensa.*  
5. *Aufero.* 6. *De.* 7. *Delubrum.*

## III.

1. The next<sup>1</sup> day he calls<sup>2</sup> the leaders of the forces<sup>3</sup> together, and tells<sup>4</sup> them that no city is more hostile<sup>5</sup> to the Greeks than the royal<sup>6</sup> (city) of the old kings.

1. *Posteris.* 2. *Convocare* = call together. 3. *Copiæ.*  
4. *Docere.* 5. *Infestus.* 6. *Regius.*

2. If we grant<sup>1</sup> that the gods exist,<sup>2</sup> and that the universe<sup>3</sup> is ruled<sup>4</sup> by their mind, I do not see why<sup>5</sup> I should<sup>6</sup> say there is no divination.<sup>7</sup>

1. *Concedo.* 2. *Esse.* 3. *Mundus.* 4. *Regere.* 5. *Cur.*  
6. I say there is no = *nego esse.* 7. *Divinatio.*

3. There is not<sup>1</sup> one of you who has not often<sup>2</sup> heard<sup>3</sup> how<sup>4</sup> Syracuse<sup>5</sup> was taken by Marcellus.

1. Not one = *nemo*. 2. *Sæpe*. 3. *Audire*. 4. *Quemadmodum*. 5. *Syracusæ*.

4. Demaratus, the father of our King Tarquin, fled<sup>1</sup> from Corinth,<sup>2</sup> because<sup>3</sup> he could not bear<sup>4</sup> the tyrant<sup>5</sup> Cypselus, to Tarquinii, and there<sup>6</sup> established<sup>7</sup> his fortunes.<sup>8</sup>

1. *Fugere*. 2. *Corinthus*. 3. *Quod*. 4. *Ferre*. 5. *Tyrannus*. 6. *Ibi*. 7. *Constituere*. 8. *Fortuna*.

## IV.

1. They say<sup>1</sup> that the death of his son was<sup>2</sup> announced to Anaxagoras [as he was<sup>3</sup>] discoursing<sup>4</sup> among<sup>5</sup> his friends<sup>6</sup> on<sup>7</sup> the nature of things, and that no<sup>8</sup> answer was given by him except<sup>9</sup> that he begot<sup>9</sup> him mortal. A glorious<sup>10</sup> speech<sup>11</sup> in<sup>12</sup> truth, and worthy<sup>13</sup> of being uttered<sup>14</sup> by so great a man.

1. *Tradere*. 2. *Nuntiare*. 3. *Omit*. 4. *Disserere*. 5. *Inter*. 6. *Familiaris*. 7. *De*. 8. Literally, nothing else (*nihil aliud*) was answered (*respondere*) except (*nisi*). 9. *Gignere*. 10. *Præclarus*. 11. *Vox*. 12. *Vero*. 13. *Dignus*. 14. *Emittere*.

2. How much wiser<sup>1</sup> Xenophon [acted<sup>2</sup>], who, when he was engaged-in-sacred-rights,<sup>3</sup> and heard that his elder<sup>4</sup> son had fallen<sup>5</sup> in battle,<sup>6</sup> merely<sup>7</sup> laid-down<sup>8</sup> the garland<sup>9</sup> from<sup>10</sup> his head: but<sup>11</sup> when he heard that he had fallen fighting<sup>12</sup> bravely,<sup>13</sup> he put<sup>14</sup> the garland on his head again.<sup>15</sup>

1. *Sapienter*. 2. *Omit*. 3. *Sacra peragere*. 4. *Major natu*. 5. *Cadere*. 6. *Prælium*. 7. *Tantum*. 8. *Deponere*. 9. *Corona*. 10. *E*. 11. *Vero*. 12. *Pugnare*. 13. *Fortiter*. 14. Put on = *imponere* with dative. 15. *Rursus*.

## V.

1. There is need<sup>1</sup> of magistrates,<sup>2</sup> without<sup>3</sup> whose wisdom<sup>4</sup> and care<sup>5</sup> the state<sup>6</sup> cannot<sup>7</sup> exist.<sup>8</sup>

1. *Opus.* 2. *Magistratus.* 3. *Sine.* 4. *Prudentia.*  
5. *Diligentia.* 6. *Civitas.* 7. With *posse.* 8. *Esse.*

2. Do you see<sup>1</sup> how<sup>2</sup> the furies<sup>3</sup> harass<sup>4</sup> the impious,<sup>5</sup> and never<sup>6</sup> suffer<sup>7</sup> them to-stand-still?<sup>8</sup>

1. *Video.* 2. *Ut.* 3. *Furia.* 4. *Agito.* 5. *Impius.*  
6. With *unquam.* 7. *Patior.* 8. *Consisto.*

3. Since<sup>1</sup> solitude<sup>2</sup> and a life<sup>3</sup> without friends<sup>4</sup> is full<sup>5</sup> of snares<sup>6</sup> and fear,<sup>7</sup> reason<sup>8</sup> admonishes<sup>9</sup> us to contract<sup>10</sup> friendships.<sup>11</sup>

1. *Cum.* 2. *Solitudo.* 3. *Vita.* 4. *Amicus.* 5. *Plenus.*  
6. *Insidiæ.* 7. *Metus.* 8. *Ratio.* 9. *Moneo.* 10. *Comparo.* 11. *Amicitia.*

4. We favor<sup>1</sup> thee; we wish<sup>2</sup> thee to enjoy<sup>3</sup> thy virtue.<sup>4</sup>

1. *Faveo.* 2. *Cupio.* 3. *Fruor.* 4. *Virtus.*

5. Lucilius used<sup>1</sup> to say<sup>2</sup> that he wished<sup>3</sup> those things which he wrote<sup>4</sup> to be read<sup>5</sup> neither by the very unlearned<sup>6</sup> nor the very learned.

1. *Soleo.* 2. *Dico.* 3. *Volo.* 4. *Scribo.* 5. *Lego.*  
6. *Indoctus.*

6. The decemvirate<sup>1</sup> and his colleagues<sup>2</sup> had completely<sup>3</sup> changed<sup>4</sup> Fabius,—a man formerly<sup>5</sup> excellent<sup>6</sup> both in peace<sup>7</sup> and in war.<sup>8</sup>

1. *Decemviratus.* 2. *Collega.* 3. *Plane.* 4. *Muto.*  
5. *Olim.* 6. *Egregius.* 7. With *domus.* 8. *Militia.*

## VI.

1. Let us consider,<sup>1</sup> first,<sup>2</sup> whether the universe<sup>3</sup> is governed<sup>4</sup> by the foresight<sup>5</sup> of the gods; <sup>6</sup> secondly,<sup>7</sup> whether they provide<sup>8</sup> for the welfare<sup>9</sup> of man.<sup>10</sup>

1. *Video.* 2. *Primum.* 3. *Mundus.* 4. *Rego.* 5. *Providentia.* 6. *Deus.* 7. *Deinde.* 8. *Consulo.* 9. *Res.* 10. *Humanus.*

2. Neoptolemus would never<sup>1</sup> have been able<sup>2</sup> to take<sup>3</sup> Troy, if he had been willing<sup>4</sup> to listen<sup>5</sup> to Lycomedes, in<sup>6</sup> whose household he had been brought<sup>7</sup> up.

1. *Nunquam.* 2. *Possum.* 3. *Capere.* 4. *Volo.* 5. *Audio.* 6. *Apud.* 7. *Educo.*

3. When<sup>1</sup> the enemy<sup>2</sup> saw<sup>3</sup> that the damages,<sup>4</sup> which they had hoped<sup>5</sup> could<sup>6</sup> not be repaired<sup>7</sup> for a long<sup>8</sup> time,<sup>9</sup> had been so<sup>10</sup> repaired by the toil<sup>11</sup> of a few<sup>12</sup> days<sup>13</sup> that there was no opportunity<sup>14</sup> left<sup>15</sup> for a sally,<sup>16</sup> they were-eager<sup>17</sup> for the original<sup>18</sup> terms<sup>19</sup> of capitulation.<sup>20</sup>

1. *Ubi.* 2. *Hostis.* 3. *Video.* 4. *Is.* 5. *Spero.* 6. *Possum.* 7. *Reficio.* 8. *Longus.* 9. *Spatium.* 10. *Ita.* 11. *Labor.* 12. *Paucus.* 13. *Dies.* 14. *Locus.* 15. *Relinquo.* 16. *Eruptio.* 17. *Recurro.* 18. *Idem.* 19. *Conditio.* 20. *Deditio.*

4. If he is about to come<sup>1</sup> to Rome without<sup>2</sup> violence,<sup>3</sup> you may<sup>4</sup> properly<sup>5</sup> remain<sup>6</sup> at home; <sup>6</sup> but<sup>7</sup> if he is about to give<sup>8</sup> up the city<sup>9</sup> to be plundered,<sup>10</sup> I fear<sup>11</sup> that Dola-bella himself<sup>12</sup> can<sup>13</sup> not fully<sup>14</sup> protect<sup>15</sup> us.

1. *Venio.* 2. *Modeste.* 3. *Possum.* 4. *Recte.* 5. *Sum.* 6. *Domus.* 7. *Sin.* 8. *Do.* 9. *Urbs.* 10. *Diripio.* 11. *Vereor.* 12. *Iipse.* 13. *Possum.* 14. *Satis.* 15. *Prosum.*

## VII.

1. When<sup>1</sup> I was on<sup>2</sup> (my) Tusculan-estate,<sup>3</sup> and wanted<sup>4</sup> to use<sup>5</sup> certain<sup>6</sup> books<sup>7</sup> out<sup>8</sup> of the library<sup>9</sup> of Lucullus, I went<sup>10</sup> to his villa,<sup>11</sup> to take<sup>12</sup> them thence<sup>13</sup> myself,<sup>14</sup> as<sup>15</sup> I used<sup>16</sup> to.

1. *Cum.* 2. *In.* 3. *Tusculanum.* 4. *Velle.* 5. *Uti.*  
6. *Quidam.* 7. *Liber.* 8. *E.* 9. *Bibliotheca.* 10. *Venire.* 11. *Villa.* 12. *Promere.* 13. *Inde.* 14. *Iipse.*  
15. *Ut.* 16. *Solere.*

2. You know-not,<sup>1</sup> madman,<sup>2</sup> what power<sup>3</sup> virtue<sup>4</sup> has ;<sup>5</sup> you use<sup>6</sup> the name<sup>7</sup> only<sup>8</sup> of virtue, you know not how<sup>9</sup> powerful<sup>10</sup> virtue itself<sup>11</sup> is.

1. *Nescire.* 2. *Insanus.* 3. *Vis.* 4. *Virtus.* 5. *Habere.*  
6. *Usurpare.* 7. *Nomen.* 8. *Tantum.* 9. *Quid.* 10. To be powerful, *valere.* 11. *Ipse.*

3. What can<sup>1</sup> you say<sup>2</sup> in<sup>3</sup> your defence<sup>4</sup> which they have not said ?

1. *Possum.* 2. *Dicere.* 3. *In.* 4. *Defensio.*

4. You are sorry<sup>1</sup> for others,<sup>2</sup> for yourself<sup>3</sup> you are neither<sup>4</sup> sorry nor<sup>4</sup> ashamed.<sup>5</sup>

1. *Miseret.* 2. *Alius.* 3. *Tu.* 4. *Nec.* 5. *Pudet.*

5. The tyrant<sup>1</sup> Dionysius, expelled<sup>2</sup> from Syracuse,<sup>3</sup> taught<sup>4</sup> boys<sup>5</sup> at Corinth.<sup>6</sup>

1. *Tyrannus.* 2. *Expello.* 3. *Syracusæ,-arum.* 4. *Docere.*  
5. *Puer.* 6. *Corinthus.*

6. This state<sup>1</sup> has not produced<sup>2</sup> any<sup>3</sup> men more illustrious<sup>4</sup> in glory<sup>5</sup> than Africanus, Lælius, and Furius.

1. *Civitas.* 2. *Ferre.* 3. *Ullus.* 4. *Clarus.* 5. *Gloria.*

## VIII.

1. Let us so<sup>1</sup> live<sup>2</sup> as always<sup>3</sup> to think<sup>4</sup> that an account<sup>5</sup> must be rendered<sup>6</sup> by us.

1. *Ita.* 2. *Vivere.* 3. *Semper.* 4. *Arbitrari.* 5. *Ratio.*  
6. *Reddere.*

2. Would-that<sup>1</sup> I could<sup>2</sup> as<sup>3</sup> easily<sup>4</sup> discover<sup>5</sup> the truth<sup>6</sup> as refute<sup>7</sup> the falsehood.<sup>8</sup>

1. *Utinam.* 2. *Posse.* 3. *Tam.* 4. *Facile.* 5. *Invenire.*  
6. *Verus.* 7. *Convincere.* 8. *Falsus.*

3. He exhorted<sup>1</sup> his friends<sup>2</sup> not to be-wanting<sup>3</sup> to the common<sup>4</sup> safety.<sup>5</sup>

1. *Hortari.* 2. *Amicus.* 3. *Deesse.* 4. *Communis.*  
5. *Salus.*

4. After<sup>1</sup> Pompey had learned<sup>2</sup> what had been done<sup>3</sup> at Corfinium, he set-out<sup>4</sup> with two legions<sup>5</sup> from Luceria, and in five days<sup>6</sup> arrived-at<sup>7</sup> Brundisium.

1. *Posteaquam.* 2. *Reperire.* 3. *Gerere.* 4. *Proficisci.*  
5. *Legio.* 6. *Dies.* 7. *Pervenire.*

5. When<sup>1</sup> by the supreme-authority<sup>2</sup> of one man there-was<sup>3</sup> no-longer<sup>4</sup> a field<sup>5</sup> in public-life<sup>6</sup> for wisdom<sup>7</sup> or<sup>8</sup> personal-influence,<sup>9</sup> I surrendered<sup>10</sup> myself neither<sup>11</sup> to my sorrows,<sup>12</sup> by which I should have been overwhelmed<sup>13</sup> if-I-had-not<sup>14</sup> resisted<sup>15</sup> them, nor<sup>11</sup> to pleasure<sup>16</sup> unworthy<sup>17</sup> of a scholar.<sup>18</sup>

1. *Quum.* 2. *Dominatus.* 3. *Esse.* 4. *Non jam.*  
5. *Locus.* 6. *Res publica.* 7. *Consilium.* 8. *Aut.* 9. *Auctoritas.*  
10. *Dedere.* 11. *Nec.* 12. *Angor.* 13. *Conficere.*  
14. *Nisi.* 15. *Resistere.* 16. *Voluptas.* 17. *Indignus.*  
18. *Doctus homo.*



## IX.

1. I find<sup>1</sup> that Plato came<sup>2</sup> to Tarentum in the consulship<sup>3</sup> of Camillus and Claudius.

1. *Reperire*. 2. *Venire*. 3. Express this by the word *consul*.

2. The plays<sup>1</sup> of<sup>2</sup> Livius are not worthy<sup>3</sup> of being read<sup>4</sup> a second<sup>5</sup> time.

1. *Fabula*. 2. *Livianus* = of Livius. 3. *Dignus*. 4. *Legere*. 5. *Iterum*.

3. The Sicilians<sup>1</sup> sometimes<sup>2</sup> make<sup>3</sup> a month<sup>4</sup> longer<sup>5</sup> by one<sup>6</sup> day<sup>7</sup> or two<sup>8</sup> days.

1. *Siculus*. 2. *Nonnunquam*. 3. *Facere*. 4. *Mensis*. 5. *Longus*. 6. *Unius*. 7. *Dies*. 8. *Biduum*. Write out the rule for the case of *dies*.

4. The Stoics<sup>1</sup> think<sup>2</sup> it does not<sup>3</sup> concern<sup>4</sup> men<sup>5</sup> to know<sup>6</sup> what is going to happen.<sup>7</sup>

1. *Stoicus*. 2. *Existimare*. 3. *Nihil*. 4. *Interesse*. 5. *Homo*. 6. *Scire*. 7. *Esse*.

5. There were [some<sup>1</sup>] who on this day accused<sup>2</sup> the king<sup>3</sup> of rashness,<sup>4</sup> the consul<sup>5</sup> of inefficiency.<sup>6</sup>

1. *Omit*. 2. *Accusare*. 3. *Rex*. 4. *Temeritas*. 5. *Consul*. 6. *Segnitia*.

6. I am afraid<sup>1</sup> that I cannot<sup>2</sup> grant<sup>3</sup> that.<sup>4</sup>

1. *Vereri*. 2. *Possum*. 3. *Concedere*. 4. *Ille*.

## X.

1. When Nasica had come<sup>1</sup> to the poet<sup>2</sup> Ennius, and the maid<sup>3</sup> had told<sup>4</sup> him<sup>5</sup> Ennius was not at home,<sup>6</sup> Nasica knew<sup>7</sup> that she had said so<sup>8</sup> at her master's<sup>9</sup> command,<sup>10</sup> and that he was within.<sup>11</sup>

1. *Venire*. 2. *Poeta*. 3. *Ancilla*. 4. *Dicere*. 5. *Is* (dative). 6. *Domus*. 7. *Sentire*. 8. Omit. 9. *Dominus*. 10. *Jussu* (abl.). 11. *Intus*.

2. A few<sup>1</sup> days<sup>2</sup> after,<sup>3</sup> when Ennius had come to Nasica and asked<sup>4</sup> for him, Nasica bawls<sup>5</sup> out that he is not at home.

1. *Paucus*. 2. *Dies*. 3. *Post*. 4. *Querere* (with the accusative). 5. *Exclamare*.

3. Then quoth<sup>1</sup> Ennius: What?<sup>2</sup> Do I not recognize<sup>3</sup> your<sup>4</sup> voice?<sup>5</sup>

1. *Inquit*. 2. *Quid*. 3. *Cognoscere*. 4. *Tuus*. 5. *Vox*.

4. Hereupon<sup>1</sup> Nasica: You are a shameless<sup>2</sup> fellow:<sup>3</sup> when I asked for you I believed<sup>4</sup> your maid (when<sup>5</sup> she said) that you were not at home. Do you not believe my-own-self?<sup>6</sup>

1. *Hic*. 2. *Impudens*. 3. *Homo*. 4. *Credere* (with dative). 5. Omit. 6. My-own-self, *ego ipse*.

## XI.

1. This<sup>1</sup> edict<sup>2</sup> having been published,<sup>3</sup> there was<sup>4</sup> no<sup>5</sup> state<sup>6</sup> which<sup>7</sup> did not send<sup>8</sup> a part<sup>9</sup> of its<sup>10</sup> Senate<sup>11</sup> to Cordova,<sup>12</sup> no<sup>5</sup> Roman citizen<sup>13</sup> who<sup>7</sup> did not come<sup>14</sup> to the meeting at<sup>15</sup> the day.<sup>16</sup>

1. Literally, which, *qui*. 2. *Edictum*. 3. *Pervulgare*. 4. *Ese*. 5. *Nullus*. 6. *Civitas*. 7. Which — not or who — not, *quin*. 8. *Mittere*. 9. *Pars*. 10. Omit. 11. *Senatus*. 12. *Corduba*. 13. *Civis*. 14. *Convenire*. 15. *Ad*. 16. *Dies*.

2. Nothing<sup>1</sup> is more praiseworthy,<sup>2</sup> nothing more worthy<sup>3</sup> of a great<sup>4</sup> and illustrious<sup>5</sup> man,<sup>6</sup> than clemency.<sup>7</sup>

1. *Nihil.* 2. *Laudabilis.* 3. *Dignus.* 4. *Magnus.*  
5. *Præclarus.* 6. *Vir.* 7. *Clementia.*

3. Don't<sup>1</sup> you know<sup>2</sup> what<sup>3</sup> sort of dead<sup>4</sup> men you are accusing<sup>5</sup> of the worst<sup>6</sup> crime?<sup>7</sup>

1. *Nonne.* 2. *Intelligere.* 3. What sort of, *qualis.*  
4. *Mortuus.* 5. *Arguere.* 6. *Summus.* 7. *Scelus.*

4. For many<sup>1</sup> ages<sup>2</sup> the name<sup>3</sup> of the Pythagoreans<sup>4</sup> was<sup>5</sup> in such high repute, that<sup>6</sup> no others<sup>7</sup> seemed<sup>8</sup> learned.<sup>9</sup>

1. *Multus.* 2. *Sæculum.* 3. *Nomen.* 4. *Pythagoreus.*  
5. To be in such high repute, *sic vigere.* 6. *Ut.* 7. *Alius.*  
8. *Videri.* 9. *Doctus.*

## XII.

1. In-the-mean-time<sup>1</sup> the Romans,<sup>2</sup> the Scipios<sup>3</sup> being sent<sup>4</sup> to Spain,<sup>5</sup> first<sup>6</sup> drove<sup>7</sup> the Carthaginians<sup>8</sup> from the province,<sup>9</sup> afterwards<sup>10</sup> carried<sup>11</sup> on serious<sup>12</sup> wars<sup>13</sup> with<sup>14</sup> the Spaniards<sup>15</sup> themselves.<sup>16</sup>

1. *Interea.* 2. *Romanus.* 3. *Scipio, -onis.* 4. *Mittere.*  
5. *Hispania.* 6. *Primo.* 7. *Expellere.* 8. *Pœnus.* 9. *Provincia.*  
10. *Postea.* 11. *Gerere.* 12. *Gravis.* 13. *Bellum.*  
14. *Cum.* 15. *Hispanus.* 16. *Ipse.*

2. While<sup>1</sup> these<sup>2</sup> things were carried<sup>3</sup> on in Asia, all<sup>14</sup> Greece<sup>4</sup> had rushed<sup>5</sup> to<sup>6</sup> arms,<sup>7</sup> in the hope<sup>8</sup> of regaining<sup>9</sup> liberty,<sup>10</sup> following<sup>11</sup> the authority<sup>12</sup> of the Lacedæmonians.<sup>13</sup>

1. *Dum.* 2. *Hic.* 3. *Gerere.* 4. *Græcia.* 5. *Concurrere.*  
6. *Ad.* 7. *Arma.* 8. *Spes.* 9. *Recuperare.*  
10. *Libertas.* 11. *Sequi* (perfect participle). 12. *Auctoritas.*  
13. *Lacedæmonius.* 14. *Omnis.*

3. When<sup>1</sup> Regulus had come<sup>2</sup> to Rome,<sup>3</sup> he set<sup>4</sup> forth his instructions<sup>5</sup> in the Senate;<sup>6</sup> but<sup>7</sup> he said<sup>8</sup> it was<sup>9</sup> not<sup>8</sup> expedient<sup>10</sup> for the captives<sup>11</sup> to be restored;<sup>12</sup> for

that they<sup>13</sup> were young<sup>14</sup> men and good<sup>15</sup> leaders,<sup>16</sup> that he (Regulus) was enfeebled<sup>17</sup> by age.<sup>18</sup>

1. *Cum*. 2. *Venire*. 3. *Roma*. 4. *Exponere*. 5. *Man-datum*. 6. *Senatus*. 7. *Sed*. 8. To say not, *negare*. 9. *Esse*. 10. *Utilis*. 11. *Captivus*. 12. *Reddere*. 13. *Ille*. 14. *Adolescens*. 15. *Bonus*. 16. *Dux*. 17. *Confectus*. 18. *Senectus*.

## XIII.

1. Phormio the<sup>1</sup> Peripatetic,<sup>2</sup> when<sup>3</sup> Hannibal,<sup>4</sup> expelled<sup>5</sup> from Carthage,<sup>6</sup> had come<sup>7</sup> to Ephesus,<sup>8</sup> is said<sup>9</sup> to have talked<sup>10</sup> some<sup>11</sup> hours<sup>12</sup> about<sup>13</sup> the duty<sup>14</sup> of a commander.<sup>15</sup>

1. *Ille*. 2. *Peripateticus*. 3. *Cum*. 4. *Hannibal*, -balis. 5. *Expellere*. 6. *Karthago*, -aginis. 7. *Venire*. 8. *Ephesus*, -esi. 9. *Dicere*. 10. *Loqui*. 11. *Aliquot*. 12. *Hora*, -ræ. 13. *De*. 14. *Officium*. 15. *Imperator*.

2. Then,<sup>1</sup> when the<sup>2</sup> rest who had heard<sup>3</sup> him were greatly<sup>4</sup> charmed,<sup>5</sup> they inquired<sup>6</sup> of<sup>7</sup> Hannibal what he<sup>8</sup> thought<sup>9</sup> of<sup>10</sup> that<sup>11</sup> philosopher.<sup>12</sup> Hannibal is said<sup>13</sup> to have answered,<sup>14</sup> that he had often<sup>15</sup> seen<sup>16</sup> many<sup>17</sup> crazy<sup>18</sup> old<sup>19</sup> men, [but<sup>20</sup>] nobody<sup>21</sup> who<sup>22</sup> was more<sup>23</sup> crazy<sup>24</sup> than Phormio.

1. *Tum*. 2. *Cæteri*. 3. *Audire*. 4. *Vehementer*. 5. *Delectare*. 6. *Querere*. 7. *Ab*. 8. *Ipsæ*. 9. *Judicare*. 10. *De*. 11. *Ille*. 12. *Philosophus*. 13. *Ferre*. 14. *Respondere*. 15. *Sæpe*. 16. *Videre*. 17. *Multus*. 18. *Delirius*, -a, -um. 19. *Senex*. 20. *Omit*. 21. *Nemo*. 22. *Qui*. 23. *Magis*. 24. I am crazy (by the verb) *deliro*, *delirare*.

## XIV.

1. If the Gauls<sup>1</sup> had attacked<sup>2</sup> the town<sup>3</sup> that night,<sup>4</sup> they would have taken<sup>5</sup> it easily,<sup>6</sup> since<sup>7</sup> no one supposed<sup>8</sup> that an enemy<sup>9</sup> was-at-hand.<sup>10</sup>

1. *Gallus.* 2. *Oppugno.* 3. *Oppidum.* 4. *Nox.*
5. *Capio.* 6. *Facile.* 7. *Quum.* 8. *Puto.* 9. *Hostis.*
10. *Adsum.*

2. For three-days,<sup>1</sup> however,<sup>2</sup> they waited<sup>3</sup> to see<sup>4</sup> what the consul would do,<sup>5</sup> who was himself enrolling-troops<sup>6</sup> at Ariminum, and had ordered<sup>7</sup> Nero to cross<sup>8</sup> the Po,<sup>9</sup> and hinder<sup>10</sup> the enemy from ravaging<sup>11</sup> the country.<sup>12</sup>

1. *Triduum.* 2. *Tamen.* 3. *Exspecto.* 4. *Omit.* 5. *Facio.*
6. *Delectum habeo.* 7. *Impero.* 8. *Transeo.* 9. *Padus.*
10. *Prohibeo.* 11. *Populor.* 12. *Ager.*

3. After<sup>1</sup> the leader<sup>2</sup> of the Gauls saw<sup>3</sup> that the Romans would-not<sup>4</sup> risk<sup>5</sup> a battle,<sup>6</sup> he repented<sup>7</sup> of his own inactivity,<sup>8</sup> for<sup>9</sup> he remembered<sup>10</sup> the counsels<sup>11</sup> of his father,<sup>12</sup> who had feared<sup>13</sup> that his son<sup>14</sup> would not be bold<sup>15</sup> enough,<sup>16</sup> and had warned<sup>17</sup> him not to lose<sup>18</sup> a single day.

1. *Posteaquam.* 2. *Dux.* 3. *Video.* 4. *Nolo.* 5. *Com-*
- mitto.* 6. *Praelium.* 7. *Pœnitet.* 8. *Inertia.* 9. *Enim.*
10. *Memini.* 11. *Consilium.* 12. *Pater.* 13. *Metuo.*
14. *Filius.* 15. *Audax.* 16. *Satis.* 17. *Moneo.* 18. *Amitto.*

## XV.

1. The next<sup>1</sup> day<sup>2</sup> I was summoned<sup>3</sup> by Pansa to Bononia.<sup>4</sup> When<sup>5</sup> I was on<sup>6</sup> the way,<sup>7</sup> it was announced<sup>8</sup> to me that he was dead.<sup>9</sup>

1. *Posterus.* 2. *Dies.* 3. *Arcesso.* 4. First declension.
5. *Cum.* 6. *In.* 7. *Iter.* 8. *Nuntio.* 9. *Morior.*

2. You (plural) seem<sup>1</sup> to me not<sup>2</sup> even<sup>3</sup> to-day<sup>4</sup> to know<sup>5</sup> what<sup>6</sup> a crime<sup>7</sup> you have dared<sup>8</sup> against<sup>9</sup> me.

1. *Videor.* 2. *Ne.* 3. *Quidem.* 4. *Hodie.* 5. *Scio.*
6. Interrogative. 7. *Facinus.* 8. *Audeo.* 9. *In.*

3. This man, if<sup>1</sup> he had been blessed<sup>2</sup> with a longer<sup>3</sup> life,<sup>4</sup> would have been much<sup>5</sup> more illustrious<sup>6</sup> than his brother,<sup>7</sup> in peace<sup>8</sup> and in war.<sup>9</sup>

1. *Si*. 2. *Contingo*; literally, "if a longer life had fallen to him." 3. *Longus*. 4. *Ætas*. 5. *Multus*. 6. *Clarus*. 7. *Frater*. 8. With *domus*. 9. *Militia*.

4. The consul, afraid<sup>1</sup> of being surrounded,<sup>2</sup> sent<sup>3</sup> cavalry<sup>4</sup> to take<sup>5</sup> possession of the hills.<sup>6</sup>

1. *Vereor* (perfect participle). 2. *Circumvenio*. 3. *Præmitto*. 4. *Eques*. 5. *Occupo*. By what constructions may the purpose be given? 6. *Collis*.

## XVI.

1. Marcellus, with<sup>1</sup> a small<sup>2</sup> body<sup>3</sup> of horse,<sup>4</sup> fought<sup>5</sup> [the enemy<sup>6</sup>] and killed<sup>7</sup> the king<sup>8</sup> of the Gauls,<sup>9</sup> Viridomarus by name,<sup>10</sup> with his<sup>11</sup> own hand.<sup>8</sup>

1. *Cum*. 2. *Parvus*. 3. *Manus*. 4. *Eques* (plural). 5. *Dimicare*. 6. Omit. 7. *Occidere*. 8. *Rex*. 9. *Gallus*. 10. *Nomen*. 11. *Suus*.

2. In the ninth<sup>1</sup> year<sup>2</sup> after<sup>3</sup> the banishment<sup>4</sup> of the kings,<sup>5</sup> when<sup>6</sup> the son-in-law<sup>7</sup> of Tarquinius had collected<sup>8</sup> a huge<sup>9</sup> army<sup>10</sup> to<sup>11</sup> avenge the wrong<sup>12</sup> done<sup>13</sup> his father-in-law,<sup>14</sup> a new<sup>15</sup> office<sup>16</sup> was created<sup>17</sup> at Rome.

1. *Nonus*. 2. *Annus*. 3. *Post*. 4. *Exactus* (literally, after the kings expelled). 5. *Rex*. 6. *Cum*. 7. *Gener*. 8. *Colligere*. 9. *Ingens*. 10. *Exercitus*. 11. *Ad* with gerundive of *vindicare*. 12. *Injuria*. 13. Simply the objective genitive: literally, "wrong of his." 14. *Socer*. 15. *Novus*. 16. *Dignitas*. 17. *Creare*.

3. At<sup>1</sup> present I will merely<sup>2</sup> ask<sup>3</sup> this,<sup>4</sup> whether<sup>5</sup> this branch-of-literature<sup>6</sup> is deservedly<sup>7</sup> suspected<sup>8</sup> by<sup>9</sup> you.

1. *Nunc*. 2. *Tantum*. 3. *Quærere*. 4. *Illud*. 5. *Ne* (enclitic). 6. *Genus scribendi*. 7. *Merito*. 8. *Suspectus*. 9. Dative.

## XVII.

1. The ninth<sup>1</sup> year<sup>2</sup> after<sup>3</sup> the expulsion<sup>4</sup> of the kings,<sup>5</sup> when<sup>6</sup> the son-in-law<sup>7</sup> of Tarquin<sup>8</sup> had<sup>9</sup> collected an immense<sup>10</sup> army,<sup>11</sup> a new<sup>12</sup> dignity<sup>13</sup> was<sup>14</sup> created at Rome, which is<sup>15</sup> called the dictatorship,<sup>16</sup>—greater<sup>17</sup> than the consulship.<sup>18</sup>

1. *Nonus*. 2. *Annus*. 3. *Post*. 4. Literally, “kings expelled”: *exigo*. 5. *Rex*. 6. *Cum*. 7. *Gener*. 8. *Tarquinus*. 9. *Colligo*. 10. *Ingens*. 11. *Exercitus*. 12. *Novus*. 13. *Dignitas*. 14. *Creo*. 15. *Appello*. 16. *Dictatura*. 17. *Magnus*. 18. *Consulatus*.

2. Do you suppose<sup>1</sup> that men<sup>2</sup> who are<sup>3</sup> said to<sup>4</sup> predict-the-future can<sup>5</sup> tell-you<sup>6</sup> whether<sup>7</sup> the<sup>8</sup> moon uses<sup>9</sup> her<sup>10</sup> own light<sup>11</sup> or<sup>12</sup> that<sup>7</sup> of the sun?<sup>13</sup>

1. *Censeo*. 2. *Is*: literally, “those.” 3. *Dico*. 4. Predict-the-future: *divino*. 5. *Possum*. 6. Tell-you: *respondeo*. 7. *Omit*. 8. *Luna*. 9. *Utor*. 10. *Suus*. 11. *Lumen*. 12. *An*. 13. *Sol*.

3. It was a glorious<sup>1</sup> sentiment<sup>2</sup> and worthy<sup>3</sup> of being uttered<sup>4</sup> by that<sup>5</sup> great man.<sup>6</sup>

1. *Præclarus*. 2. *Vox*. 3. *Dignus*. 4. *Emitto*. 5. That great: *tantus*. 6. *Vir*.

## XVIII.

1. When<sup>1</sup> Balbus had<sup>2</sup> said this,<sup>3</sup> then<sup>4</sup> Cotta said, with-a-smile,<sup>5</sup> “You are<sup>6</sup> late, Balbus, in telling me what to defend;<sup>7</sup> for<sup>8</sup> while<sup>9</sup> you were discussing<sup>10</sup> I was myself pondering<sup>11</sup> what to say in<sup>12</sup> reply, and<sup>13</sup> not so-much<sup>14</sup>

for-the-purpose-of<sup>15</sup> refuting<sup>16</sup> you as of finding-out<sup>17</sup> the-things<sup>18</sup> which I did not<sup>19</sup> understand."<sup>20</sup>

1. *Cum*. 2. *Dico*. 3. Relative. 4. *Tum*. 5. *Arrideo* (present participle). 6. I am late in telling, *sero præcipio*. 7. *Defendo*. 8. *Enim*. 9. Ablative absolute. 10. *Disputo*. 11. *Mecum meditor*. 12. In reply, *contra*. 13. *Neque*. 14. So much — as, *tam* — *quam*. 15. *Causa*. 16. *Refello*. 17. *Requiro*. 18. With *is*. 19. *Minus*. 20. *Intelligo*.

## XIX.

1. I do not care<sup>1</sup> how<sup>2</sup> rich<sup>3</sup> Gyges is.<sup>4</sup>

1. Express with *refert*. 2. *Quam*. 3. *Dives*. 4. *Esse*.

2. Who<sup>1</sup> more<sup>2</sup> illustrious in Greece<sup>3</sup> than<sup>4</sup> Themistocles? who<sup>5</sup> when<sup>6</sup> he had<sup>7</sup> been driven into exile<sup>8</sup> did<sup>9</sup> not do harm to his thankless<sup>10</sup> country,<sup>11</sup> but did<sup>12</sup> the same<sup>13</sup> that Coriolanus had<sup>12</sup> done twenty<sup>14</sup> years<sup>15</sup> before.<sup>16</sup>

1. *Quis*. 2. *Clarus*. 3. *Græcia*. 4. Write in two ways. 5. *Qui*. 6. *Cum*. 7. *Expellere*. 8. *Exilium*. 9. Do harm to, *Injuriam ferre* with dative. 10. *Ingratus*. 11. *Patria*. 12. *Facere*. 13. *Idem*. 14. *Viginti*. 15. *Annus*. 16. *Ante*.

3. In the first<sup>1</sup> of the spring<sup>2</sup> the consul came<sup>3</sup> to Ephesus, and, having<sup>4</sup> received the troops<sup>5</sup> from<sup>6</sup> Scipio, he held<sup>7</sup> a speech<sup>8</sup> in-presence-of<sup>9</sup> the soldiers,<sup>10</sup> in<sup>11</sup> which, after<sup>12</sup> extolling their bravery,<sup>13</sup> he exhorted<sup>14</sup> them to<sup>15</sup> undertake a new<sup>16</sup> war<sup>17</sup> with<sup>18</sup> the Gauls, who had<sup>19</sup> [as he said<sup>11</sup>] helped Antiochus with<sup>11</sup> auxiliaries.<sup>20</sup>

1. *Primus*. 2. *Ver*. 3. *Venire*. 4. *Accipere*. 5. *Copiae*. 6. *A*. 7. *Habere*. 8. *Contio*. 9. *Apud*. 10. *Miles*. 11. Omit. 12. *Collaudare* (ablative absolute). 13. *Virtus*. 14. *Adhortari*. 15. *Suscipere* with *ad* and gerundive. 16. *Novus*. 17. *Bellum*. 18. *Cum*. 19. *Juvare*. 20. *Auxilium*.



## XX.

1. The plays<sup>1</sup> of Livius are not worth<sup>2</sup> reading<sup>3</sup> more-than-once.<sup>4</sup>

1. *Fabula*. 2. *Dignus*. 3. *Legere*. 4. *Iterum*.

2. What<sup>1</sup> style-of-speaking<sup>2</sup> was<sup>3</sup> in vogue in those<sup>4</sup> times<sup>5</sup> can<sup>6</sup> best<sup>7</sup> be<sup>8</sup> learned from<sup>9</sup> the works<sup>10</sup> of Thucydides.<sup>11</sup>

1. *Qui*. 2. *Dicendi genus*. 3. *Vigere*. 4. *Ille*. 5. *Tempus*. 6. *Posse*. 7. *Maxime*. 8. *Intelligere*. 9. *Ex*. 10. *Scriptum*. 11. *Thucydides* (genitive *-di*).

3. When<sup>1</sup> I had<sup>2</sup> been engaged a-couple-of-years<sup>3</sup> in<sup>4</sup> law<sup>5</sup> cases, and my name<sup>6</sup> was very-well-known<sup>7</sup> in the forum, I went<sup>8</sup> away from Rome. When<sup>1</sup> I had<sup>9</sup> come to Athens,<sup>10</sup> I stayed<sup>11</sup> six months<sup>12</sup> with<sup>13</sup> Antiochus, and renewed<sup>14</sup> the study<sup>15</sup> of philosophy<sup>16</sup> under<sup>17</sup> this teacher.<sup>18</sup>

1. *Cum*. 2. *Versari*. 3. *Biennium*. 4. *In*. 5. *Causa*. 6. *Nomen*. 7. *Jam celebratum*. 8. *Proficisci*. 9. *Venire*. 10. *Athenæ*. 11. *Esse*. 12. *Mensis*. 13. *Cum*. 14. *Renovare*. 15. *Studium*. 16. *Philosophia*. 17. *Omit*. 18. *Doctor* (ablative absolute).

## XXI.

1. When<sup>1</sup> Paullus, to whom the war<sup>2</sup> with<sup>3</sup> Perses<sup>4</sup> had-been-allotted,<sup>5</sup> had<sup>6</sup> gone home,<sup>7</sup> that<sup>8</sup> very<sup>9</sup> day<sup>10</sup> he noticed<sup>11</sup> that his little<sup>12</sup> daughter Tertia was low-spirited.<sup>13</sup>

1. *Cum*. 2. *Bellum*. 3. *Cum*. 4. *Perses* (genitive *æ*). 5. To be allotted, *obtingere* (active). 6. *Redire*. 7. *Domus*. 8. *Is*. 9. *Ipsæ*. 10. *Dies*. 11. *Animadvertere*. 12. Diminutive of *filia*. 13. *Tristiculus*.

2. "What<sup>1</sup> is the matter,"<sup>2</sup> said<sup>3</sup> he, "my Tertia?" "Why<sup>1</sup> are you sad?"<sup>4</sup> "My father,"<sup>5</sup> said she, "Persa is<sup>6</sup> dead."

1. *Quid*. 2. Omit. 3. *Inquit*. 4. *Tristis*. 5. *Pater*.  
6. *Perire*.

3. Then <sup>1</sup> the-father <sup>2</sup> embraced <sup>3</sup> the girl <sup>4</sup> tenderly <sup>5</sup> and said, "I <sup>6</sup> accept the omen,<sup>7</sup> my daughter."

Now <sup>8</sup> this <sup>9</sup> Persa was a puppy,<sup>10</sup> which had <sup>11</sup> died.

1. *Tum*. 2. The father, *ille*. 3. *Complecti*. 4. *Puella*.  
5. Comparative of adverb *arte*. 6. *Accipere*. 7. *Omen*.  
8. *Autem*. 9. *Is*. 10. *Catellus*. 11. *Mori*.

## XXII

1. Plato, when <sup>1</sup> he was <sup>2</sup> provoked with a slave <sup>3</sup> of <sup>4</sup> his, bade <sup>5</sup> him doff <sup>6</sup> his tunic <sup>7</sup> forthwith <sup>8</sup> and hold <sup>9</sup> out his shoulders <sup>10</sup> to the scourge,<sup>11</sup> intending <sup>12</sup> to beat him himself <sup>13</sup> with his own hand.<sup>14</sup>

1. *Cum*. 2. *Irasci* with dative. 3. *Servus*. 4. Of his = *suus*. 5. *Jubere*. 6. *Ponere*. 7. *Tunica*. 8. *Statim*.  
9. Hold out = *præbere*. 10. *Scapulæ*, -arum. 11. *Verber*, -is, plural. 12. Future participle of *cædere*. 13. *Ipse*.  
14. *Manus*.

2. When <sup>1</sup> he was-aware <sup>2</sup> that he was provoked, he kept <sup>3</sup> his hand suspended,<sup>4</sup> just-as <sup>5</sup> he had raised <sup>6</sup> it, and stood <sup>7</sup> like <sup>8</sup> one <sup>9</sup> about to strike.<sup>10</sup>

1. *Postquam*. 2. *Intellegere*. 3. *Detinere*. 4. *Suspendere*. 5. *Sicut*. 6. *Tollere*. 7. *Stare*. 8. *Similis*.  
9. Omit. 10. *Cædere*.

3. Being-asked <sup>1</sup> then <sup>2</sup> by a friend <sup>3</sup> who had happened <sup>4</sup> in what <sup>5</sup> he was-about : <sup>6</sup> "I am exacting <sup>7</sup> penalty,"<sup>8</sup> said he, "from <sup>9</sup> a passionate <sup>10</sup> man."<sup>11</sup>

1. *Interrogare*. 2. *Deinde*. 3. *Amicus*. 4. Happened in = *forte intervenire*. 5. *Quis*. 6. *Agere*. 7. *Exigere*.  
8. *Pæna*, plural. 9. *Ab*. 10. *Iracundus*. 11. *Homo*.

## XXIII.

1. While<sup>1</sup> this<sup>2</sup> was<sup>3</sup> done at Veii,<sup>4</sup> meantime<sup>5</sup> the citadel<sup>6</sup> at Rome was in great<sup>7</sup> danger.<sup>8</sup>

1. *Dum*. 2. *Hic* (neuter plural). 3. *Agere*. 4. *Veii*, *Veiorum*. 5. *Interim*. 6. *Arx*. 7. *Ingens*. 8. *Periculum*.

2. For<sup>1</sup> the Gauls,<sup>2</sup> having<sup>3</sup> observed a human<sup>4</sup> track,<sup>5</sup> climbed-up<sup>6</sup> to the top<sup>7</sup> in a glimmering<sup>8</sup> night<sup>9</sup> in such<sup>10</sup> silence<sup>11</sup> that<sup>12</sup> they not<sup>13</sup> only escaped-the-notice-of<sup>14</sup> the guards,<sup>15</sup> but<sup>16</sup> did not-even<sup>17</sup> rouse<sup>18</sup> the dogs,<sup>19</sup> — a creature<sup>20</sup> on-the-alert<sup>21</sup> for<sup>22</sup> noises<sup>23</sup> at night.<sup>24</sup>

1. *Namque*. 2. *Gallus*. 3. *Notare* (ablative absolute). 4. *Humanus*. 5. *Vestigium*. 6. *Evadere*. 7. *Summus*, neuter. 8. *Sublustris*. 9. *Nox*. 10. *Tantus*. 11. *Silentium*. 12. *Ut*. 13. *Non solum*. 14. *Fallere*. 15. *Custos*. 16. *Sed*. 17. *Ne — quidem*. 18. *Excitare*. 19. *Canis*. 20. *Animal*. 21. *Sollicitus*. 22. *Ad*. 23. *Strepitus*. 24. *Nocturnus*.

## XXIV.

1. Death<sup>1</sup> alone<sup>2</sup> confesses<sup>3</sup> how puny<sup>4</sup> are the bodies<sup>5</sup> of men.<sup>6</sup>

1. *Mors*. 2. *Solus*. 3. *Fateor*. 4. *Quantulus*. 5. *Corpusculum*. 6. *Homo*.

2. There<sup>1</sup> is nothing<sup>2</sup> better<sup>3</sup> than agriculture,<sup>4</sup> nothing sweeter,<sup>5</sup> nothing worthier<sup>6</sup> of a free<sup>7</sup> man.

1. *Omit*. 2. *Nihil*. 3. *Bonus*. 4. *Agricultura*. 5. *Dulcis*. 6. *Dignus*. 7. *Liber*.

3. When<sup>1</sup> Livius Salinator was<sup>2</sup> going out of the city<sup>3</sup> to<sup>4</sup> carry on war<sup>5</sup> against<sup>6</sup> Hasdrubal, Fabius advising<sup>7</sup> him to ascertain<sup>8</sup> the strength<sup>9</sup> of the enemy<sup>10</sup> first,<sup>11</sup> he

answered<sup>12</sup> that he would not let<sup>13</sup> a chance<sup>14</sup> for fighting<sup>15</sup> pass.<sup>13</sup>

1. *Cum*. 2. *Egredi* (with ablative). 3. *Urbs*. 4. *Gerere*.  
5. *Bellum*. 6. *Adversus*. 7. *Moneo*, ablative absolute.  
8. *Agnoscere*. 9. *Vis* (plural). 10. *Hostis*. 11. *Prius*.  
12. *Respondeo*. 13. *Omitto*. 14. *Occasio*. 15. *Pugno*  
(genitive of gerund).

## XXV.

1. During<sup>1</sup> these events,<sup>2</sup> horsemen<sup>3</sup> had been sent<sup>4</sup> to Alba, to<sup>5</sup> transport<sup>6</sup> the populace<sup>7</sup> to Rome. Then legions<sup>8</sup> were brought<sup>9</sup> for the-purpose<sup>2</sup> of destroying<sup>10</sup> the city.

2. When these<sup>5</sup> entered<sup>11</sup> the gates,<sup>12</sup> there was not that commotion<sup>13</sup> such<sup>14</sup> as is apt<sup>15</sup> to belong-to<sup>16</sup> captured<sup>17</sup> cities, when, on-the-capture<sup>18</sup> of the citadel<sup>19</sup> by force,<sup>20</sup> the rush<sup>21</sup> of armed<sup>22</sup> men<sup>2</sup> through the city confounds<sup>23</sup> all things;

3. but a sad<sup>24</sup> silence<sup>25</sup> so enchained<sup>26</sup> the minds<sup>27</sup> of all, that, forgetting<sup>28</sup> what to leave,<sup>29</sup> what to take<sup>30</sup> with them, they stood<sup>31</sup> on the thresholds,<sup>32</sup> or wandered<sup>33</sup> through their homes.<sup>34</sup>

1. *Inter*. 2. *Omit*. 3. *Eques*. 4. *Mitto*. 5. Express by a relative clause. 6. *Traduco*. 7. *Multitudo*. 8. *Legio*. 9. *Duco*. 10. *Diruo*. 11. *Intro*. 12. *Porta*. 13. *Tumultus*. 14. *Qualis*. 15. *Soleo*. 16. Expressed by the case of "cities." 17. *Capio*. 18. Express by a passive verb. 19. *Arx*. 20. *Vis*. 21. *Cursus*. 22. *Armo*. 23. *Misceo*. 24. *Tristis*. 25. *Silentium*. 26. *Defigo*. 27. *Animus*. 28. *Obliviscor*. 29. *Relinquo*. 30. *Fero*. 31. *Sto*. 32. *Limen*. 33. *Pervagor*. 34. *Domus*.

## XXVI.

1. Whenever<sup>1</sup> the spring<sup>2</sup> had-set-in,<sup>3</sup> Verres devoted<sup>4</sup> himself to journeyings,<sup>5</sup> in which he showed<sup>6</sup> himself so-very<sup>7</sup> energetic<sup>8</sup> that nobody<sup>9</sup> ever<sup>10</sup> saw<sup>11</sup> him sitting<sup>12</sup> on<sup>13</sup> a horse.<sup>14</sup>

1. *Cum.* 2. *Ver.* 3. *Cæpit esse.* 4. *Do.* 5. *Iter.* 6. *Præbeo.* 7. *Usque eo.* 8. *Impiger.* 9. *Nemo.* 10. *Unquam.* 11. *Video.* 12. *Sedeo.* 13. *In.* 14. *Equus.*

2. For he used to ride<sup>1</sup> in a sedan and eight, in which there was a cushion<sup>2</sup> stuffed<sup>3</sup> with rose-leaves.<sup>4</sup> Moreover,<sup>5</sup> he had<sup>6</sup> one<sup>7</sup> garland<sup>8</sup> on his<sup>9</sup> head,<sup>10</sup> another<sup>11</sup> on his<sup>9</sup> neck,<sup>12</sup> and ever-and-anon<sup>13</sup> he gave<sup>14</sup> his nose a little-net<sup>15</sup> of the finest<sup>16</sup> of thread,<sup>17</sup> with tiny<sup>18</sup> meshes,<sup>19</sup> full<sup>20</sup> of rose-leaves.

1. To ride in a sedan and eight, *Lectica octophoro ferri.* 2. *Pulvinus.* 3. *Farcio.* 4. *Rosa* (singular). 5. *Autem.* 6. *Habeo.* 7. *Unus.* 8. *Corona.* 9. *Omit.* 10. *Caput.* 11. *Alter.* 12. *Collum.* 13. *Idem.* 14. *Ad nares sibi admove.* 15. *Reticulum.* 16. *Tenuis.* 17. *Linum.* 18. *Minutus.* 19. *Macula.* 20. *Plenus.*

## LATIN GRAMMAR.

## I.

1. DECLINE *carcer, deus, arcus, dies*, giving the gender of each, with the rule for it, and marking the quantities of penultimate and final syllables in all the cases.

2. Give the gender of *via, gladius, Tiberis*, with the rule for each. Give Ablative singular of *sedile, turris*; Genitive plural of *vir, pater, hostis, equa*.

3. Decline *alter, alacer, iste*. Compare *gracilis, inferus, ingens, malus*; compare *prope*, and the adverbs formed from *acer, altus*.

4. Give principal parts of *pono, sedeo, domo, vincio*. Give Future Active Participle and Future Passive Participle of *pono*, and Pluperfect Active Second Person Plural of *sedeo*, marking the quantities of all the syllables of both verbs. Inflect the Present Indicative of *eo*; of *nolo*.

5. Name some classes of verbs followed by the Genitive, by the Dative, by the Ablative, by two Accusatives. Give some of the rules for the Subjunctive after Relative Pronouns; for its use after Particles. How is *not* expressed with the Imperative? How is a Wish expressed?

## II.

1. Before what vowels have *g* and *c* a soft sound? What is the gender of *Januarius*? of *Corinthus*? of *Aquilo*? Give the rule for each. What is an Epicene Noun? What words are naturally neuter? What is Declension? What are some of the general rules for Declension? Which apply to all nouns?

2. Decline *dea, Penelope, vir, vis, barbiton, sedile*. When does the Nominative plural of the third declension end in *-ia*? Give the three general rules for gender in nouns of the third declension. What is the gender of *tellus, legio, arundo, amnis*? Give the rule for each. Decline *domus, bos, Vergilius*. What are the Heterogeneous Nouns, and Heteroclitics? Give some examples of each. Give the rule for the derivation of Patronymics; of Diminutives. What do the terminations *-ium, -arium, -ile*, in nouns denote?

3. Decline *alius, quisquam, tu*. Give the rules for comparing adverbs. What is a Gerund? a Gerundive? a Supine? a Participle? Give the synopsis of *possum* in the Third Person Singular throughout the verb. Inflect the Imperatives, Active and Passive, of *moneo, amo, capio, audio*. What are Irregular Verbs? Give the list of them. What compounds of *facio* have *fi* in the passive? How do you form Frequentative Verbs? how Inceptives? how Intensives? How are adverbs formed from adjectives?

4. What does *ultimus* mean? What do *hic* and *ille* mean when used together? Explain all the uses of *suus* which you know. When is the Nominative of the Third Person wanting? Translate in two ways, "A woman of remarkable beauty" (*femina, maximus, pulchritudo*). Explain the Genitive,—*pridie ejus diei*. How do you translate the name of a town to which motion proceeds? How from which? How the name of a town where an event occurs? How in each case if the name of the place is not the name of a town?

5. Tell all the ways in which a voluntary agent can be translated. Translate, "We pity (*miseret*) them." When is the Passive Voice followed by the Accusative of the

thing? What is Synecdoche? How do you translate expressions denoting time how long, and time at which something happens? What cases follow *potior*, *fido*, *doceo*, *peto*, *juvat*, *voco*? What two different Ablative constructions may follow a comparative? In what senses does *ut* take the Subjunctive? in what the Indicative? What construction follows *priusquam*, *quin*, *cum*? Mention four cases of a Subjunctive after *qui*.

6. Tell all the ways you know of translating a clause denoting a purpose into Latin. When is the Infinitive used without a subject? State the use of the Genitive, Dative, Accusative, and Ablative of Gerunds. What is the general order of words in a Latin sentence?

7. Give the rules for Increment in nouns and verbs. When do two consonants lengthen the preceding vowel? Give the general rules for the quantity of final syllables.

### III.

1. Decline *honor*. What is its gender? Why? Is this gender natural or grammatical, and what is the difference between these two classes of genders? Mention some classes of nouns which are masculine from their signification. Some which are feminine. How do neuter nouns of the third declension end? Decline any one you think of. How do you distinguish the declensions of nouns?

2. Decline *duo*. Decline *levior*. Of what degree of comparison is it? Give the other degrees of comparison of the same word. Compare *magnus*. Mention other adjectives which are irregular in their comparison.

3. Decline *ipse*. Give all genders of the Nominative singular of *quis*. Of the Interrogative *qui*. Decline *siquis*.

4. What is an Irregular Verb? Give a synopsis of the



verb *esse*. Write out the Present tense of this verb in all modes and persons. How do you distinguish the conjugations? What are the principal stems of verbs? Give the terminations of the First Person Indicative of a verb of the third conjugation in all the tenses. What is a Frequentative Verb?

5. What is the Increment of a verb? What is the quantity of verbal increments? What is the general rule for the quantity of the increments of nouns?

#### IV.

1. Give the three general rules for the gender of nouns of the third declension. Gender and rule for *Boreas*, *manus*, *res*, *virtus*.

2. Decline the following nouns, marking the quantities of the penultimate and final syllables in all the cases: *imago*, *domus*, *poema*, *respublica*, *juvenis*.

3. Decline *tu*, *uterque*, *aliquis*, *brevior*. Compare *climens*, *par*, *diu*. What does the termination *-ile* in nouns denote? *-lentus* in adjectives?

4. Give principal parts of *juvo*, *resisto*, *spondeo*, *haurio*, marking the quantities of all the syllables in all the forms. Inflect the Perfect Active Indicative of *resisto*, Imperative Active and Passive of *haurio*. Give the synopsis of *fio* in the present stem.

5. Give several cases of nouns which follow the verb *sum*, and the rules for them. What cases follow *utor*, *recordor*, *parco*, *pœnitet*? What cases do the prepositions *super*, *præ*, *inter*, govern respectively? How is a Purpose expressed?

#### V.

1. Decline the following nouns, marking the quantity of

the penultimate and final syllables through all the cases : *ala, genius, pars, conclave, acus, acies*. Give the gender of each noun, with rule for it.

2. Decline the adjectives *acer* and *facilis* ; the pronouns *quidam* and *uter*. Compare *acer, facilis, felix, malus*. Form adverbs from *pulcher* and *prudens*, and compare them. How do you express in Latin *five, fifth, and five times* ?

3. Give the principal parts of the following verbs, marking the quantity of all the syllables : *sto, torqueo, cado, cædo, cedo, ordior*. Inflect the Perfect Subjunctive Active of *cedo*, and the Present Imperative Passive of *ordior*, marking the quantities throughout.

4. What case or cases follow *pudet, fungor, præsum, doceo* ? Translate into Latin : 1. He asked (*rogo*) him whether (*num*) Caius had come (*venio*). 2. He said (*dico*) that Caius would come. 3. He orders (*impero*) Caius to come. 4. He was hindered (*impedio*) by Caius from (*quominus*) coming. 5. He was waiting (*opperior*) until (*dum*) Caius should come. 6. No one (*nemo*) waited who was able (*possum*) to come. 7. If he had waited, I should not have come. 8. Would that (*utinam*) Caius would come. 9. Do not come, Caius.

## VI.

1. Decline *virtus, domus, puer, calcar*, giving the gender of each with the rule for it, and marking the quantity of the penultimate and final syllables in all the cases.

2. Give the gender of *juvenis, canon, ratio, flos*, with the rule for each. Give the Ablative singular of *Anchises, aper, tribus* ; Genitive plural of *nubes, respublica, mater*.

3. Decline *piger, gravior, ambo, quisque*. Compare *frugi, humilis*, and the adverbs formed from *acer, durus*.

4. Give the principal parts of *veto*, *laccio*, *pendo*, *pendeo*, *sepelio*, *mentior*. Mark the quantity of all the syllables of the verbal forms *adjuvare* (from *adjuvo*), *tetenderitis* (from *tendo*), and give all the voices, moods, tenses, numbers, and persons in which they may be found. Inflect the Future Perfect Indicative Passive of *moneo*, marking the quantity of all the syllables.

5. Translate into Latin in as many ways as you are able :

1. He sent (*mitto*) men to seek (*peto*) an oracle (*oraculum*).
  2. He heard (*audio*) that Caius had fled (*fugio*).
  3. He feared (*timeo*) that Caius had fled.
  4. He was angry (*irascor*) that Caius had fled.
- What cases follow the prepositions *præ*, *sub*, *inter*, respectively ? Give the rules which you remember for the Dative after verbs.

## VII.

1. Decline *filia*, *vesper*, *navis*, *nemus*, *domus* ; mark the quantity of the penultimate and final syllables through all the cases ; give the gender of each noun, with the rule. Give the rules for the formation of the Genitive plural of the third declension. How are the Diminutives formed from nouns ?

2. Decline *crudelis*, *unus*, *duo*, *idem*, *aliquis* ; compare *crudelis*, *facilis*, *superus*, *vetus*. What are the meanings respectively of the terminations *-osus* (e. g. *vinosus*), *-ilis* (e. g. *mobilis*), *-ax* (e. g. *fallax*) ? Give the Latin for a hundred, two hundred, and so on to nine hundred inclusive. Mark the quantity of the penultimate and final syllables in all the Latin words given in this section.

3. Give the principal parts of *juvo*, *veho*, *sentio*, *censeo*, *cædo*, *audeo*. Inflect the Present Subjunctive Passive of *juvo* ; the Perfect Subjunctive Active of *veho* ; the Future

Indicative Passive of *cædo*; the Imperfect Subjunctive Active of *volo*. Mark the quantity of the penultimate and final syllables.

4. What case or cases respectively follow the verbs *vendo*, *dono*, *pœnitet*, *rogo*, *solvo*, *condemno*? Translate into Latin: He orders (*impero*) Caius to be present (*adsum*). He feared (*metuo*) that Caius was not present. He sent (*mitto*) Caius to be present. He was angry (*irascor*) because (*quod*) Caius was present. He is happy (*beatus*) provided (*dummodo*) Caius is present. He did not know (*nescio*) on what day (*dies*) Caius was present. Where may the cæsural pause occur in the dactylic hexameter?

### VIII.

1. Decline the following nouns, giving the gender of each with the rule, and marking the quantity of the penultimate and final syllables in all the cases: *vir*, *Boreas*, *imago*, *murmur*, *fides*, *rus*, *portus*.

2. What is denoted by the terminations *-mentum* (e. g. *documentum* from *doceo*), *-or* (e. g. *fautor* from *faveo*), *-idus* (e. g. *calidus* from *caleo*)? Compare *dexter*, *frugi*, *sacer*, *juvenis*, *merito*, and the adverbs from *alacer* and *æger*.

3. Decline *integer*, *alius*, *dispar*, *plus*, marking the quantity as in section one. Decline *iste*, *meus*, *quidam*.

4. Mark the quantity of all the syllables of the verbal forms in this section (4). Give the principal parts of the following verbs: *ambio*, *sto*, *maneo*, *arcesso*. Give a synopsis of *fin* in the present stem. Inflect the Future Perfect Indicative, Active and Passive, of *cædo*. In what places can *capere* be found? In what places *venimus*, and how distinguished by difference of quantity?

5. By what cases may *sum* be followed? Translate: He

knew (*scio*) that Caius was coming (*venio*). He begged (*oro*) Caius to come. He feared (*timeo*) that Caius would not come. He sent (*mitto*) men to hinder (*obsto*) Caius from coming. Explain the use of *ille*, *is*, *hic*, *iste*, *ipse*, *sui*. Give some of the rules for the case of a noun referring to the same person or thing as a preceding noun.

## IX.

1. Decline *Annius*, *radix*, *fons*, *flos*, *exemplar*, *manus*. Give the gender of each, with the rule. Give the rules for the formation of the Ablative singular of the third declension. What are the meanings of the endings *-mentum* (e. g. *impedimenta*), *-bulum* (e. g. *pabulum*), *-tor* (e. g. *doctor*), *-etum* (e. g. *rosetum*) ?

2. Decline *alacer*, *supplex*, *iste*, *qualis*, *unusquisque*. Compare *ager*, *suavis*, *dives*. What is the Latin for *four*, *forty*, *four hundred*, *fourth*, *fortieth*, *four hundredth* ? What is the significance of the ending *-ax* (e. g. *ferax*) ? *-cundus* (e. g. *verecundus*) ?

3. Give the principal parts of *cupio*, *cubo*, *tego*, *foveo*, *vincio*, *veho*. Inflect the Future Indicative of *redeo* and *morior* ; and the Present Subjunctive of *suspicio* and *malo*.

4. Give all the rules for the construction of names of towns. What classes of verbs in Latin are constructed with the Genitive case ? What classes with the Ablative ? What is the difference of meaning between the Imperfect and Pluperfect tenses of the Subjunctive in Conditional Sentences ? How are clauses in English introduced by *that* to be translated into Latin ? What is the difference between *ne* and *ut non* ? Write down the following words in four columns, and mark the quantity of every syllable : *fieri*, *arbores*, *habere*, *desinit*, *fiebat*, *venerunt*, *eveho*, *laborat*,

*improbus, dederint, perbrevis, diei, victrices, congredi, nomen, dedecori, cupidine, auditur, non, abstulerunt, peritus, requireres, dirutus, maritimus.*

## X.

1. Decline *locus, sol, vis, mare, motus*. Give the gender of each with the rule. What classes of nouns of the third declension form their Genitive plural in *-ium*.

2. Decline *uter*. Give the Ablative singular and Genitive plural of *celeber, crudelis, supplex*. Compare *carus, humilis, parvus*. Form adverbs from *æger* and *crudelis*, and compare them. Give, in Latin, the multiples of ten from twenty to one hundred inclusive. Decline *aliquis*.

3. Give the principal parts of *verto, veto, gaudeo, vincio, vinco*. Inflect the singular of the Present Subjunctive Active of *verto* and *veto*; of the Future Indicative Passive of *vincio*; and of the Imperfect Subjunctive of *eo*.

4. What Latin prepositions are followed by the Ablative case? By what case are *in* and *sub* followed? With what case or cases are the following verbs respectively constructed: *impero, pudet, doceo, obliviscor, ignosco*? What do *utinam adsit* and *utinam adesset* respectively mean? Give the rules for the Subjunctive mood in the following sentences: 1. *Nemo est qui te non metuat*. 2. *Fortis est qui te non metuat*. 3. *Dicit adesse hominem qui te non metuat*. Write out the following words, and mark the quantity of all the syllables: *transituros, sustulit, oceanus, congredi, virorum, reducit, tradiderint, mare, Cæsare, ruina, humilis, victrices, acceperas, hostilis, ratus, nemini, tenebris, reliquæ, nomina, requiris, graviora, distrahit, antiquus, mentitur*.

## XI.

1. Decline *triumvir, crinis, dies, cubile, imago, domus*.

Give the gender of each noun, with the rule. Give the rules for the formation of the Genitive plural of the third declension. Give the meaning of the terminations *-ile* (e. g. *caprile*), *-ium* (e. g. *collegium*).

2. Decline *totus, dulcis, plus, quisquam*. Compare *capax, nequam, pauper*. Give the Latin for ten and multiples of ten as far as one hundred. Form adjectives from *Roma, Athenæ, civis*.

3. Give the principal parts of *depromo, jaceo, verito, ordior, jacio, spondeo*. Inflect the Perfect Subjunctive Passive of *audeo*; the Imperfect Subjunctive of *fio*; the Present Subjunctive Passive of *domo*; the Imperative of *ordior*.

4. Give the rules for the cases that follow the verbs *potior, pudet, doceo, egeo, ignosco*. Mention the various constructions by which a Purpose may be expressed in Latin. Give the rules for the use of the Subjunctive in Relative Clauses. When is a Dactylic Hexameter called Spondaic?

## XII.

1. Decline *Lucius, puppis, manus, bos, September*, giving the gender of each noun with the rule, and marking the quantities of the final syllables throughout the declension of the first three. Give the rules for the genders of the following nouns: *os, sermo, lapis, dies, exemplar*.

2. Decline *acer, par, fortis, idem*. Compare *similis, pulcher, parvus*. What are the meanings of the terminations *-lentus* (e. g. *opulentus*), *-ax* (e. g. *minax*), *-ilis* (e. g. *humilis*)? Give the Latin for *eleven, nineteen, seventy-six; seven, fourteenth, twenty-fifth*.

3. Give the principal parts of *lædo, sero, seco, cædo*,

*gaudeo, cado*. Inflect the Present Subjunctive Active of *laedo*; the Future Passive of *sero*; the Imperative Passive of *cædo*.

4. What case or cases follow the following verbs respectively: *condemno, celo, pœnitet, pareo, interest*? Write in Latin "at Cannæ"; "to Cannæ"; "from Cannæ"; "at Rome." Translate: 1. Si Cæsar adest, lætor. 2. Si adsit, læter. 3. Si adesset, lætarer. 4. Si adfuisset, lætatus essem. 5. Si adfuerit, lætabor.

## XIII.

1. Write down the following words and mark the quantity of the penult, giving the rules of prosody: *tempora, responderunt, dederint, discedo, iniquus, oceanus, remanet, egi, impedit, manus, brevis, cervices, protulit, nolite, vectigal*.

2. Meaning of termination *-etum* in *rosetum*? Of *-olus* in *filiolus*? Of *-ax* in *loquax*? Of *-mentum* in *tegumentum*?

3. Write the Perfects and Supines of *diligo, reperio, maneo, perfundo, indulgeo, cedo, cædo, cado, moveo, cognosco*.

4. Compare *acer, bene, magnus, similis, gravis*.

5. Give the Present Subjunctive and Future Indicative Third Person Singular of *sum, cerno, eo, malo, caveo, venio*.

6. Decline *sedile, fructus, homo, vir, ingenium, melior*.

7. Decline *aliquis, alter, ipse*.

8. What is the Latin for *five*? For *fifth*? For *five times*? For *fifty*? *fiftieth*? *fifty times*? Write in Latin: One man in every ten.

## XIV.

1. Give the gender of each of the following nouns, and the rule for it: *pax, pactio, manus, munus, salus, ager, pes*.

2. Decline the following nouns, marking the quantity of



the penultimate and final syllables in each form: *filius, iter, domus, dies*. Give the rules for the formation of the Ablative singular and Genitive plural of the third declension.

3. Decline *solus, fortis, idem, quidam*. Compare *ingens, similis, sacer*. Give the meanings of the following endings of nouns and adjectives: *-ula (cornicula), -ium (ministerium), -etum (saxetum), -icius (patricius)*.

4. Give the principal parts of the verbs *fundo, veto, verto, voveo, sancio, cædo*. Give the Third Person Singular of the Present Subjunctive Active, and of the Future Indicative Passive of *veto, verto*, and *sancio*. Inflect the Imperfect Subjunctive Passive of *facio*, and the Future Indicative Active of *transeo*.

5. By what cases respectively are these words followed: *occurro, condemno, sub, fruor, noceo*?

## XV.

1. Decline *poema, domus, turris, Baiæ*, marking the quantity of all penultimate and final syllables. Give the gender of each and the rule. Write the Vocative singular and the Dative and Accusative plural of *dea, genius, locus*.

2. State the significance of the terminations in *vehiculum, orator, virtus, docilis*. Give the word from which each is derived, and the rule for the quantity of the penult. Translate *istic, istuc, istinc*. What kind of a verb is *cito*? Account for the quantity of its penultimate vowel. Give the principal parts of *tono, potior, vivo, fido, vincio*, and *faveo*.

3. What case or cases follow *similis, fungor, recordor, in, inter, interest*? What classes of verbs are followed by both Genitive and Accusative? What two constructions may follow *circumdo*?

4. Give the rules for the Subjunctive after *ut*, *utinam*, *cum*, *dum*, and *quod* (because). What is the meaning of *quominus*, and after what expressions is it used? When may an Infinitive with its Subject Accusative stand independent in a sentence? When may the Subject of an Infinitive be in the Nominative?

## XVI.

1. Decline *deus*, *alius*, *tu*, *siquis*, and *audax*, marking the quantity of penultimate and final syllables. Compare *audax*, *multus*, and *nequam*. Compare adverbs formed from *audax*, *bonus*, *miser*, and *honorificus*. Give the rules for the gender of *formido*, *caput*, *pax*, *fas*, and *Tiberis*.

2. Inflect the Future Indicative and Present Subjunctive of *teneo*, *gero*, *sto*, and *fio*, marking the quantity of all the syllables. Give the Infinitives of *tollo* and *scribo*. Give all the Participles of *haurio* and *orior*. Give the principal parts of *uro*, *vendo*, *paro*, *pario*, *pareo*, *memini*, and *nanciscor*.

3. What case or cases follow *fido*, *jubeo*, *memini*, *præsum*, *existimo*, *pœnitet*, *contra*, *clam*, and the interjection *O*? By what two cases may price or value be expressed, and when is one used and when the other? What case follows the comparative when *quam* is omitted? When is it necessary that *quam* be expressed? Give five important rules for the Ablative without a preposition after verbs.

4. When is *ut* omitted before the Subjunctive? Give the rules for the Subjunctive in Relative Clauses. Translate into Latin, "The plan of setting the city on fire," using first the Gerund and then the Gerundive. Plan, *consilium*. To set on fire, *inflammare*.

## XVII.

1. Decline together *frater meus*. Also decline in the singular, with the proper gender of the adjective annexed, *nox (unus)*, *fides (Punicus)*, *mare (uterque)*, *Orion (nimbosus)*, marking the quantity of penultimate and final syllables. Decline in the plural, marking the quantities in the same way, *ensis (pugnax)*, *portus (tutus)*, *finis (extremus)*, *mos (vetus)*. Give the rule for the gender of each of the above nouns. What is an Epicene Noun? Give the significance of the terminations *-ax* in (*pugnax*), *-osus* in (*nimbosus*), also of *-urio* in (*esurio*), and *-sco* in (*rubesco*). Form an abstract noun from *solus*. Compare *pugnax*, *extremus*, *vetus*. Compare adverbs formed from *carus*, *malus*, *similis*.

2. Give the principal parts of *reperio*, *ordior*, *cupio*, *circumdo*, *aufero*, *tango*, *arcesso*, marking the quantity of the penult. Inflect (marking the quantity of the penult) the Future Active Singular of *maneo* and *venio*; and the plural of the Present Subjunctive Passive of *facio* and *peto*. Give all the Infinitives and Participles of *purgo*, *pergo*, *morior*; and inflect the Imperative Active of *dico*.

3. What case or cases follow *ob*, *occurro*, *moneo*, *gaudeo*, *irascor*, *sub*, *pudet*, *pro*, *præditus*? Give the rules for verbs which govern two Accusatives. In what ways may the agent be expressed? State in what ways the construction of names of towns differs from that of other names of places. Give all the rules for the Subjunctive, denoting either purpose or result; after *quasi* and *priusquam*; in the Indirect Discourse.

## XVIII.

1. Decline together in the singular *Marcus Tullius Cicero senex*. In the same way decline (both in singular and

plural) with the adjective annexed in the proper gender, *dies* (*fastus*), *flumen* (*aureus*); in the plural: *arma* (*victrix*), *dea* (*immortalis*). Mark the quantity of all the vowels in the above nouns and adjectives. State the significance of the terminations *-men* in (*flumen*), *-eus* in (*aureus*), *trix* in (*victrix*.) What classes of words of the third declension form the Ablative in *-i* only?

2. Give the principal parts of *adjuvo*, *nolo*, *venio*, *paciscor*, *sperno*, *foveo*, *mordeo*, *scindo*, marking the quantity of the penultimate vowel. Give the synopsis of *mordeo* and *paciscor*; give all the Infinitives and Participles; and inflect the Imperatives.

3. Give all the rules you remember for verbs that govern the Dative. State the case or cases by which the price, the source, time when, and place where (including names of towns), are expressed, and give the rules. Give the rule for the Subjunctive in the following sentences: *Quid enim, Catilina, est quod te jam in hac urbe delectare possit?* *Nunc ego mea video quid intersit.* *Supplicatio decreta est his verbis quod urbem incendiis liberassem.* *C. Sulpicium misi qui ex ædibus Cethegi, si quid telorum esset, efferret.* *O fortunate adolescens qui Homerum præconem inveneris.*

## XIX.

1. Decline in the singular: *facies*, *idem*, *ovile*, *sidus*, *filius*. Decline in the plural: *portus*, *dea*, *navis*. Write the gender over the nouns (rules not required), and mark the quantity of all penultimate and final syllables. 1. Give the significance of the terminations *-ile* in *ovile*; *-men* in *gestamen*. 2. Form an abstract noun from *felix*; from *æger*. 3. Form a noun denoting the masculine agent from *adjuvo*, and a frequentative verb from *cies*, and account for

the quantity of their penultimate vowels. 4. Compare *humilis*, *juvenis*, and adverbs formed from *felix* and *æger*.

2. 1. Give the principal parts of *cado*, *cædo*, *tono*, *reperio*, *curro*, *pasco*, *pasciscor*, marking the quantity of the penult. 2. Give all the Infinitives and Participles of *abeo*, *ulciscor*; the Present Indicative of *fio*; the Future Indicative Active and the Present Subjunctive Passive of *munio*, with the quantity of all the penults.

3. 1. What case or cases follow *super*, *tenuis*, *recordor*, *fruo*, *similis*? 2. Give the principal parts of *parco* and *confido*, and the case that follows each. 3. Give the rules for the two cases after *pudet*, *do*, *doceo*, *moneo*. 4. Give the Latin for "at home," "at Carthage," "from Carthage," "from Italy," "to Athens." *Tu discessu ceterorum nostra tamen, qui remansissemus cæde te contentum esse dicebas*. 5. Give the rules for *discessu* and *cæde*. What is the antecedent of *qui*?

4. 1. Give the rules for the Subjunctive after *dum*, *cum*, *quominus*. 2. Would *ne* or *ut non* follow *restat* and *moneo*, respectively? Why? *Statuisti quo quemque proficisci placeret, . . . dixisti paululum tibi esse etiam nunc moræ, quod ego viverem. Reperti sunt duo equites Romani qui te ista cura liberarent. Idoneus est qui impetret quem legatum velit. Exclusi eos quos tu ad me salutatum miserat*. 3. Explain the Subjunctives in the above sentences; the tense of *impetret*. 4. Give the rule for *salutatum*.

## XX.

1. Decline *soror*, *vir*, *vis*, *vulnus*, *animal*. Give the gender of each of these nouns, with the rule. Mark the quantity of all the penultimate and final syllables you write in this section. Give the Genitive plural of *gens* and *hostis*, with the rules.

2. Decline *sacer, acer, alius*. Compare *similis, superus, parvus, juvenis*. Form and compare adverbs from *acer, altus*. Decline *idem, tu*, and *aliquis*. Give the Latin numerals for *sixty, seventy, eighty, six hundred, seven hundred, eight hundred*.

3. Give the principal parts of *vinco, vincio, spondeo, domo, lacesso, cædo, audeo*. All the Participles and Infinitives of *adipiscor* and *fero*. The Second Person Singular of the Future Indicative and of the Imperfect Subjunctive of *audeo, audio, fugio, eo, possum, volo*. Mark all penultimate and final syllables you write in this section.

4. How is price or value expressed in Latin? time in which? place where? What case or cases follow the verbs *miseret, obliviscor, ignosco, fungor, rogo*, respectively?

5. What is a Spondee? an Iambus? What is an Heroic Hexameter?

## XXI.

1. Decline *mare, pignus, cor, fructus*. Give the gender of these nouns, with the rules. Mark the quantity of any increments that occur in their declension.

2. Compare *humilis, niger, malus*. Give the synopsis of *morior* and *gaudeo*. Give the Second Person of the Future Indicative, and of the Present, Imperfect, and Perfect Subjunctive of *spero, fero, volo*, in the Active Voice. The same of *facio* and *audio* in the Passive. Give the principal parts of *fateor, tono, peto, vincio, colo, tango*.

3. Compare *diu*. Form and compare an adverb from *brevis*. What are the meanings of the terminations of *copiosus, civilis, audacia, victrix*? What cases follow *infero, pœnitet, parco, careo, fruor, tenax, fretus, in, ante, super*?

4. How is the place to which, the price, the agent of a Passive verb expressed in Latin?

5. How is a condition contrary to the fact expressed in Latin? State one case in which a Relative Clause requires the Subjunctive. One case where the Subjunctive is used in Principal Clauses. What is a Gerundive? Give an example.

## XXII.

1. Decline *Penelope*, *mons*, *cubile*, and give the gender with the rules. Mark the quantity of penults and final syllables of the above words. Decline *uterque*. Decline *acer*, and compare it. Form an adverb from it, and compare it.

2. Compare *senex* and *munificus*. Give the derivation of *filiolus*, *documentum*, *quercetum*, *audax*, *capesso*, and the meaning of the terminations. Give all the Participles and Infinitives of *vereor* and *cædo*, and mark the quantity of the penults. Inflect the Imperative of *fero*, *ordior*, *nolo*, *fateor*. Give the Present and Imperfect Subjunctive First Person Singular of *adjuvo*, *eo*, *soleo*, and *fugio*, marking the quantity of the penults. Give the principal parts of *pario*, *pareo*, *paro*, *reddo*, *redeo*, *surgo*, and of the compound of *ab* and *fero*.

3. What case or cases follow *refert*, *irascor*, *circumdo*? How do the constructions of names of towns differ from those of other words? How is the degree of difference expressed in Latin? How the agent by the participle in *-dus*? What construction is used after verbs of Saying? Verbs of Fearing? How may a Purpose be expressed? How does a Gerund resemble a noun? How does it resemble a verb? How does the Gerundive differ from it?

## XXIII.

1. Decline *filius*, *pectus*, *manus*, *animal*. Give the gen-

ders and mark the quantity of all penultimate and final syllables. Give the gender and the Ablative singular and Genitive plural of *imago, mons, vis, turris, sedile*. Decline *capax, æger*, and the comparative of *miser*. Compare *facilis, acer*, and an adverb formed from *piger*. Decline *uterque*.

2. Give the First Person of the Future Indicative, and all tenses of the Subjunctive of *possum, pario, sono, vereor, eo, soleo*. Mark quantities of penults. Give the Infinitives and Participles, Active and Passive, of *spondeo, morior, paro, quero, queror, adipiscor*.

3. Explain the force of the derivative terminations in *longitudo, tenax, vehiculum, Priamides, clamito, vinolentus, filiulus*.

4. What is the construction in Latin of the place in which (including names of towns)? the price or value? the degree or measure of difference between objects compared? the agent in the Passive Voice? What case or cases follow *credo, pudet, fungor, refert, aptus, avidus, dignus, in, pro, propter, doceo, condemno, circumdo*?

5. How is a future condition with its conclusion expressed? How a condition contrary to fact? How an object clause after a verb of Fearing; of Commanding; of Saying? Translate *cave eas* and explain the peculiarity. When can you use the Gerundive for the Gerund? Give an example of each. Give an example of the use of the Supine.

#### XXIV.

1. Decline the following words, and give their genders respectively: *onus, collis, salus, gradus*. Decline *felix, quidam, senex*. Compare *parvus, beneficus*. Form and compare an adverb from *acer*.

2. Give a synopsis of *mordeo, scio*, in the Active Voice,



and of *hortor, orior, polliceor, nolo*. Give the principal parts of *paro, pario, pareo, ulciscor, pango, tollo*.

3. What are the meanings of the derivative terminations in *acritudo, clamito, vinculum, parvulus*?

4. What case or cases follow *moneo, prosum, rogo, in, præter*? What is the force of *num* in a question? of *ne*? Explain the mood and tense of *mansisset* in, "*Mansissetque utinam fortuna.*" Explain the mood of *esset* and the case of *fronde* in "*Nos delubra miseri, quibus ultimus esset ille dies velamus fronde.*" Explain the mood of *polliceantur* in "*Ad eum legati veniunt, qui polliceantur obsides dare.*" With what other constructions could the same idea be expressed? What is the use of the supine in *-um*? in *-u*? Explain construction of *usui* and *fore* in "*Magno sibi usui fore arbitrabatur.*" Describe the feet of two syllables. Mark the quantity of the penults and last syllables in the above extracts.

## XXV.

Translate the following extract:—

Imitatus est homo Romanus veterem illum Socratem, qui cum omnium sapientissimus esset sanctissimeque vixisset, ita in iudicio capitis pro se ipse dixit, ut non supplex aut reus sed magister aut dominus videretur esse iudicum; quin etiam cum ei scriptam orationem disertissimus orator Lysias attulisset, quam si ei videretur edisceret ut ea pro se in iudicio uteretur, non invitus legit et commode scriptam esse dixit.

Decline *veterem, magister, iudicum, ei*.

Compare *invitus, sanctissime*.

Give the principal parts of *imitatus, vixisset, attulisset, edisceret, uteretur*.

Give all the Participles and Infinitives of *scriptam esse*.

What are the derivations of *Romanus*, *orationem*, *orator*, and the meaning of the derivative terminations in each?

What is the construction (i. e. where are they made and why) of *omnium*, *se*, *videretur* (in each of the two cases), *edisceret*, *ea*, *scriptam esse*, *ei* (first one), *attulisset*?

What are the principal rules for the change from Direct Discourse to Indirect?

## XXVI.

Translate :—

Sin autem quis requirit, quæ causa nos impulerit, ut hæc tam sero literis mandaremus, nihil est, quod expedire tam facile possimus. Nam, cum otio langueremus, et is esset reipublicæ status, ut eam unius consilio atque cara gubernari necesse esset; primum, ipsius reipublicæ causa, philosophiam nostris hominibus explicandam putavi, magni existimans interesse ad decus et ad laudem civitatis, res tam graves tamque præclaras Latinis etiam literis contineri. Eoque me minus instituti mei pœnitet, quod facile sentio, quam multorum non modo discendi, sed etiam scribendi, studia commoverim. Complures enim, Græcis institutionibus eruditi, ea, quæ didicerant, cum civibus suis communicare non poterant, quod illa, quæ a Græcis acceperant, Latine dici posse diffident. Quo in genere tantum profecisse videmur, ut a Græcis ne verborum quidem copia vinceremur.

Decline *civibus*, *decus*, *status*, *quis*, *graves*.

Compare *minus*, *graves*.

Give the principal parts, Active and Passive (if any), of *requirit*, *impulerit*, *sentio*, *diffident*, *eruditi*, *vinceremur*.

Give the synopsis of *didicerant*, *commoverim*, *pœnitet*.

Explain construction (where made and why) of *possimus*, *esset*, *hominibus*, *magni*, *me*, *instituti*, *scribendi*, *commoverim*, *diffident*.

## ARITHMETIC.

## I.

1. Reduce  $\frac{3}{8}$ ,  $\frac{5}{16}$ ,  $\frac{7}{24}$ , and  $\frac{2}{48}$  to their Least Common Denominator.
2. Divide  $1\frac{1}{2}$  by 42. Divide  $\frac{7}{8}$  of  $\frac{1}{9}$  by  $\frac{4}{11}$  of  $\frac{2}{3}$ .
3. Reduce  $\frac{18\frac{3}{4}}{\frac{2}{3} \text{ of } \frac{2}{3} \text{ of } \frac{2}{3}}$  to its simplest form.
4. Reduce  $\frac{1}{22}$  of a gallon to the fraction of a gill.
5. Add  $\frac{3\frac{1}{2}}{5\frac{3}{4}}$ ,  $\frac{7}{8}$ , and  $\frac{2}{10}$  of  $\frac{6}{7}$ .
6. How long must \$133 be on interest (simple) at 7 per cent to gain \$32,585?
7. What is the compound interest on \$1,000 for 3 years at 7 per cent (interest payable annually)?
8. What is the cube of  $\frac{7}{8}$ ? of .006?
9. Divide 46.08 by 1,000. Divide 1.096641 by 15.21.
10. What is the square root of 104.8576?
11. What is a Circulating Decimal? Give an example of a Circulating Decimal.
12. What are Duodecimals?

## II.

1. Find the Greatest Common Divisor of 48 and 130.
2. Reduce  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{7}{12}$ , and  $\frac{1}{18}$  to their Least Common Denominator.
3. What part of  $\frac{1}{9}$  is  $\frac{1}{3}$ ?
4. Subtract  $15\frac{1}{2}$  from  $18\frac{3}{4}$ .

5. Divide  $1\frac{1}{2}$  by  $1\frac{1}{8}$ . Multiply the same.
6. Divide  $\frac{1}{8}$  of  $\frac{2}{3}$  of  $2\frac{1}{2}$  by  $\frac{10}{3\frac{1}{2}}$ .
7. Write  $1\frac{1}{32}$  and  $2\frac{1}{18}$  in a decimal form. Give the division in decimals of the first by the second.
8. Divide .09 by .0016. Multiply them.
9. Divide 876.196 by 2.12. If the decimal point were moved, in the first, two places to the left, and, in the second, one place to the right, how many times greater or less would the quotient be?
10. Find the square root of 49.2804.
11. What is the fourth power of 2? of 0.2? of .02?
12. If a man travels 64 rods in .05 of an hour, how many minutes will it take him to go a mile?
13. Find the simple interest on \$1,000 for 1 yr. 2 mos. and 12 ds.
14. How many feet, board measure, in a plank 12 ft. 4 in. long, 2 ft. 3 in. wide, and 4 in. thick? (Multiplication of Duodecimals.)

### III.

1. What is the Least Common Multiple of 20, 24, and 36?
2. Add  $\frac{5}{8}$ ,  $\frac{4}{9}$ ,  $2\frac{3}{15}$ , and  $3\frac{3}{20}$ .
3. Multiply 48 by  $\frac{5}{16}$ . Divide  $\frac{87}{186}$  by  $\frac{5}{16}$ .
4. Reduce  $\frac{\frac{1}{2} \text{ of } \frac{4}{7} \text{ of } 7\frac{3}{8}}{19\frac{6}{8}}$  to its simplest form.
5. Reduce  $\frac{1}{8}$  of a bushel to the fraction of a pint.
6. Reduce 5 yds. 2 ft. 6 in. to the decimal of a rod, long measure.
7. Multiply 34.27 by 60,000. Divide 10634.16 by .4506.

8. At what rate per cent must \$370 be put on interest to gain \$55.50 in three years?

9. What is the amount of \$25 for 3 yrs. 5 mos. at compound interest?

10. What is the third power of 30? of .03?

11. What is the square root of 104.8576?

12. What are the contents of a granite block that is 8 ft. 9 in. long, 3 ft. 2 in. wide, and 2 ft. 5 in. thick? (Multiplication of Duodecimals.)

#### IV.

1. What is the Greatest Common Divisor of 1181 and 2741?

2. Reduce  $\frac{5}{8}$ ,  $\frac{3}{13}$ , and  $\frac{7}{17}$  to a Common Denominator.

3. Divide  $\frac{7}{8}$  of  $\frac{16}{19}$  by  $\frac{4}{11}$  of  $\frac{33}{9}$ .

4. Add  $\frac{31}{53}$ ,  $\frac{7}{8}$ , and  $\frac{9}{10}$  of  $\frac{6}{7}$ .

5. Reduce  $\frac{5}{8}$  of a gallon to quarts, pints, etc.

6. Multiply 4 lbs. 8 oz. 16 dwt. 20 gr. by 72.

7. Find the interest on \$76.72 from April 18, 1852, to January 26, 1855, at 6 per cent.

8. What principal at 6 per cent will amount to \$360,585 in 16 months?

9. Multiply .427 by 345.

10. Divide 87.69 by 47, also by .47.

11. What is the square root of 747.4756?

12. Give an example of a Continued Fraction.

#### V.

1. Name all the Prime numbers in the series of numbers between 1 and 30 inclusive; resolve all the Composite

numbers into their Prime Factors; and name all the perfect squares, cubes, and other powers in the same series.

2. From  $\frac{3}{4}$  of  $\frac{4}{5}$  take  $\frac{1}{2}$  of  $\frac{2}{3}$ .
3. Divide  $\frac{3\frac{1}{2}}{6\frac{1}{2}} \times 72\frac{1}{2}$  by  $\frac{2}{3}$  of  $\frac{3}{5}$  of  $9\frac{3}{5}$ .
4. Reduce 9 rds. 1 ft. and 6 in. to the fraction of a furlong.
5. Multiply 8.764 by 40.015.
6. What is the square of 11? of .11?
7. Divide 769.428 by 200; by .00002.
8. Transform the Infinite Decimal .216 into its equivalent Vulgar Fraction.
9. What quantity of boards will be required to lay a floor 14 ft. 8' 3" in length and 13 ft. 6' 9" in width? (Multiplication of Duodecimals.)
10. Find the square root of 4.190209.
11. Find the interest on \$76.72 from April 18, 1852, to January 26, 1855, at 6 per cent.
12. If \$50 gain \$5.60 in 3 yrs. 6 mos., at simple interest, what is the rate per cent?
13. Give an example of a Continued Fraction.

## VI.

1. What are the Prime Factors of 360?
2. What part of a mile is one inch?
3. Reduce  $\frac{9\frac{7}{8}}{3\frac{1}{4}}$  to a Simple Fraction.
4. Add  $\frac{5}{8}$  of a pound,  $\frac{3}{8}$  of a shilling, and  $\frac{5}{8}$  of a penny together.
5. What is the product of  $\frac{2}{3}$  of  $\frac{7}{11}$  of 15, and  $\frac{1}{15}$  of  $11\frac{5}{8}$ ?
6. Divide 100 by  $4\frac{7}{8}$ .
7. What is the square of 10.01?

8. Divide .1 by .0001. Divide 10 by .1.
9. Reduce  $\frac{3}{32}$  to a decimal. Reduce  $\frac{3}{140}$  to a Circulating Decimal.
10. What is the interest on \$1461.75 for 4 yrs. 9 mos. at 8 per cent?
11. The interest on \$437.21 for 9 yrs. 9 mos. is \$127.884 : what is the rate of interest?
12. Find the square root of 4.426816.

## VII.

1. What is the Least Common Multiple of 21, 36, 50, and 64?
2. Add together  $\frac{2}{9}$ ,  $\frac{16}{21}$ , and  $\frac{4}{13}$ , and from their sum subtract  $\frac{6}{15}$ .
3. Multiply  $\frac{24}{4\frac{1}{2}}$  by  $\frac{2}{13}$  of  $2\frac{1}{2}$ .
4. Reduce  $\frac{8}{11}$  of a furlong to inches.
5. Multiply 200.043 by 2.021.
6. Divide 9.00081 by 900; 4004004 by .002; .000624 by 324.
7. What are the contents of a granite block 12 ft. 2' 3" long, 6 ft. 8' 9" wide, and 4 ft. 9' 2" thick?
8. What is the amount of \$5216.75 from January 21, 1860, to July 3, 1863, at 8 per cent, compound interest?
9. Find the cube of 10.1; of 1.01.
10. Find the square root of 49.87604.
11. Define a Circulating Decimal and give an example. What is a Continued Fraction?
12. What is the difference between an Arithmetical and a Geometrical Progression?

## VIII.

1. What is a Prime Number? Find the Prime Factors of 4800.

2. What Prime Factors compose the Greatest Common Divisor and the Least Common Multiple of several numbers? Find the Greatest Common Divisor and the Least Common Multiple of 84, 126, and 140.

3. From  $\frac{8}{7}$  of  $\frac{7}{15}$  subtract  $\frac{8}{40}$  of  $1\frac{1}{3}$ .

4. Divide  $\frac{2}{15}$  of  $2\frac{8}{3}$  of  $3\frac{1}{3}$  by  $\frac{24\frac{1}{2}}{1\frac{8}{15} \times 1\frac{1}{2}}$ .

5. Give the rule for pointing off in the multiplication of decimals, and explain the reason.

6. Multiply 0.0400268 by 0.260075.

7. Divide 0.011825369 by 5.884. What is the quotient of 118253690 by the same divisor?

8. Reduce  $\frac{8}{226}$  to a Circulating Decimal. Verify the result by reducing it back to a Vulgar Fraction.

9. Reduce 0.845 of a mile to furlongs, rods, feet, and inches.

10. The interest on \$127.50 from June 26, 1798, to May 8, 1802, was \$36.975: calculate the rate of interest.

11. Find the square root of 7.333264.

12. Find the cube root of 96702.579.

13. If 6 men can build 20 feet of a stone-wall in 10 days, how many men can build 360 feet of the same wall in 90 days?

## IX.

1. Reduce 10917 to the product of its Prime Factors.

2. Find the Greatest Common Divisor of 720, 336, and 1736; Least Common Denominator of  $\frac{22}{18}$ ,  $\frac{7}{32}$ ,  $\frac{2}{24}$ .



3. From  $36\frac{2}{10}$  take  $\frac{4}{5}$ .
4. Multiply  $\frac{2}{3}$  of  $1\frac{2}{3}$  of  $4\frac{1}{5}$  by  $\frac{36\frac{1}{2}}{2\frac{1}{8} \div 1\frac{1}{4}}$ . What part of  $\frac{6\frac{1}{2}}{11}$  yards is  $\frac{7}{8}$  of an inch?
5. Give the rule for pointing off in multiplication of decimals, and explain its reason.
6. Reduce 0.0007648267 to a Vulgar Fraction.
7. The product of three numbers = 70.04597; two of them equal 3.91 and 3.0005 respectively. Find the third.
8. Reduce the Infinite Decimal  $0.81\dot{2}4\dot{7}$  to a Vulgar Fraction.
9. Find the amount of \$1000 for 2 yrs. 2 mos. 12 ds., compound interest, at 6 per cent, payable annually.
10. Find the square root of 39.037504.
11. Find the cube root of 0.000000148877.
12. Find the third power of 3; of 0.3; of 0.003.
13. If a family of 9 persons spends \$305 in 4 months, how many dollars will maintain it 8 months, if 5 persons more were added to the family? Multiply 10 ft. 3' 2" by 6 ft. 7' 8".

## X.

1. What is a Prime Number? When are two numbers prime to each other? What Prime Factors compose the Greatest Common Divisor and the Least Common Multiple of several numbers? Find the Greatest Common Divisor and Least Common Multiple of 156, 234, and 260.
2. From  $\frac{2}{25}$  of  $1\frac{2}{3}$  subtract  $\frac{1}{27}$  of  $\frac{2}{40}$ ; reduce the answer to its lowest terms, and reduce it to a decimal.
3. Divide  $1\frac{1}{5}$  of  $\frac{2}{55}$  of  $1\frac{2}{3}$  by  $\frac{\frac{1}{2}}{49 + 4.55}$ .

4. Reduce  $\frac{17640}{29100}$  to its lowest terms. Reduce  $\frac{7}{10}$ ,  $\frac{11}{12}$ ,  $\frac{4}{15}$ ,  $\frac{6}{25}$ , and  $\frac{1}{60}$  to their Least Common Denominator, add them, and reduce the sum to its simplest form.

5. Multiply 6.4 by 1.5. Multiply 0.64 by 0.15. Divide 701.5 by 2.806. Divide 0.7015 by 280.6. Reduce the last answer to its lowest terms as a Vulgar Fraction.

6. The number 209.069673692836 is composed of three factors, of which two are 20083.6 and 0.260075. Find the third factor.

7. State the rule for pointing off in the multiplication of decimals, and give its reason.

8. Reduce the Infinite Decimal  $0.0\dot{1}3\dot{6}$  to its lowest terms as a Vulgar Fraction, and verify the result by reducing back to a decimal.

9. Calculate the date at which a sum of \$450, which was put at simple interest at 8 per cent, December 30, 1797, amounted to \$642.30.

10. Reduce 6 fur. 30 r. 6 ft.  $7\frac{1}{2}$  in. to the decimal of a mile.

11. Divide 5 cwt. 12 lbs. 4 oz. by 7. Multiply 2 ft. 3' 7" by 9 ft. 5' 11". Reduce £17 9s. 3d. to Federal money, taking 4s. 6d. = \$1.

12. Find the proportion in which sugars worth 5 cents and 8 cents a pound must be taken to form a mixture worth  $6\frac{3}{4}$  cents a pound.

13. How many digits compose the third of a number containing two digits? What is the reason of your answer? What is the third power of 3? of 0.3? of 0.03? of 30?

14. Find the cube root of 39512.447416.

15. Find the square root of 13 to five places of decimals.

16. If 3 men can build a wall 60 feet long, 8 feet high, and 3 feet thick, in 64 days of 9 hours, how many days of 8 hours will 20 men require to build a wall 400 feet long, 9 feet high, and 5 feet thick?

## XI.

1. Which of the numbers 5, 9, 13, 18, 21, 25, are Prime Numbers? and which of them are prime to the number 10?

2. Find the Greatest Common Divisor and the Least Common Multiple of 630, 840, and 2772.

3. From  $\frac{3}{4}$  of  $\frac{2}{5}$  subtract  $\frac{3}{20}$  of  $2\frac{7}{9}$ ; reduce the answer to its lowest terms; and reduce it to a decimal.

4. Divide  $\frac{1}{2}$  of  $\frac{2}{5} \times 13\frac{3}{4}$  by  $\frac{\frac{1}{2}}{2\frac{1}{2} - \frac{1}{4}}$ .

5. Multiply 76000 by 1.05. Multiply 0.076 by 0.0105. Divide 2926.5 by 0.3902. Divide 29.265 by 390.2. Reduce the last answer to its lowest terms as a Vulgar Fraction.

6. Reduce to their lowest terms as Vulgar Fractions the Infinite or Circulating Decimals  $0.\dot{2}7$ ,  $0.01\dot{2}7$ ,  $0.00\dot{2}7$ ,  $0.00\dot{2}7$ .

7. Calculate the date at which a sum of \$234, which was put at simple interest at 9 per cent, October 25, 1798, amounted to \$351.

8. Reduce 6 fur. 30 r. 6 ft.  $7\frac{1}{2}$  in. to the decimal of a mile.

9. Find the cube root of 9358 to two places of decimals.

10. If 6 men can build a wall 80 feet long, 10 feet high, and 9 feet thick, in 100 days of 9 hours, how many days of 10 hours will be required by 15 men to build a wall 200 feet long, 9 feet high, and 5 feet thick?

## XII.

1. Find the Greatest Common Divisor and Least Common Multiple of 144 and 780.

2. Reduce  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{7}{15}$ , and  $\frac{11}{18}$  to their Least Common Denominator.

3. What part of  $\frac{4}{5}$  is  $\frac{3}{8}$ ?

4. Subtract  $15\frac{1}{4}$  from  $18\frac{3}{8}$ .

5. Divide  $1\frac{1}{2}$  by  $1\frac{1}{8}$ . Multiply the two together.

6. Divide  $\frac{1}{6}$  of  $\frac{4}{9}$  of  $2\frac{1}{2}$  by  $\frac{1^2}{3\frac{1}{2}}$ .

7. Write  $1\frac{1}{32}$  and  $2\frac{1}{16}$  in a decimal form. Give the division in decimals of the first by the second.

8. Divide .09 by .0016. Multiply them.

9. Divide 876.196 by 2.12. If the decimal point were moved, in the first, two places to the left, and, in the second, one place to the right, how many times greater or less would the quotient be?

10. Find the cube root of 51 to three places of decimals.

11. Reduce to their lowest terms as Vulgar Fractions the Infinite or Circulating Decimals,  $0.234\dot{3}$ ,  $0.00234\dot{3}$ ,  $0.01234\dot{3}$ ,  $0.00234\dot{3}$ .

12. If a man travel 64 rods in .05 of an hour, how many minutes will it take him to go a mile?

13. Find the simple interest on \$1000 for 6 yrs. 4 mos. and 15 ds. at 8 per cent.

14. How many feet, board measure, in a plank 12 ft. 4 in. long, 2 ft. 3 in. wide, and 4 in. thick?

### XIII.

1. Reduce  $\frac{23829}{89700}$  to its lowest terms.

2. Reduce  $\frac{7}{10}$ ,  $\frac{11}{12}$ ,  $\frac{4}{15}$ ,  $\frac{6}{25}$ , and  $\frac{1}{80}$  to their Least Common Denominator; add them, and reduce the result to a decimal form.

3. Divide  $\frac{9}{10}$  of  $\frac{7}{8}$  of  $8\frac{1}{2}$ , by  $\frac{\frac{1}{2} \text{ of } 2\frac{7}{8}}{18\frac{1}{2}}$ . Simplify, and reduce to lowest terms by cancelling.

4. Multiply 37900000 by 2.005. Multiply 0.0379 by 0.2005. Write the numbers 37900000 and 0.0379 in words.

5. Divide 1909.14 by 0.02708. Divide 190.914 by 27080.

6. Reduce to their lowest terms as Vulgar Fractions the Infinite or Circulating Decimals,  $0.\dot{0}08\dot{1}$ ,  $0.008\dot{1}$ ,  $0.1\dot{0}8\dot{1}$ ,  $0.10\dot{8}$ .

7. Find the simple interest on \$1000 for 5 yrs. 4 mos. and 15 ds. at 20 per cent. To how much will \$1000 amount in 4 years, at compound interest, at 20 per cent?

8. Reduce 5 fur. 33 r. 9 ft.  $10\frac{1}{2}$  in. to the decimal of a mile. Reduce £17 8 s. 9 d. to Federal money, taking 4 s. 6 d. = \$1.

9. Multiply 2 ft. 3' 7" by 9 ft. 5' 11".

10. Find the cube root of 77869 to three places of decimals. Find the square root of 0.5 to five places of decimals.

#### XIV.

1. Reduce  $\frac{16200}{24840}$  to its lowest term. What is a Prime number? When are two numbers said to be prime to each other?

2. Find the value of  $\frac{7}{9} - \frac{1}{8} + \frac{43}{4} + \frac{22}{18} + \frac{7}{12}$ ; and reduce the result to its lowest terms, and also to a decimal form.

3. From  $3\frac{1}{2}$  subtract  $\left(\frac{7}{15} \text{ of } \frac{41}{8} \text{ of } 1\frac{1}{2}\right) \div \frac{47}{1\frac{7}{8}}$ . Simplify by cancelling.

4. Multiply 2.708 by 0.007005. What is the product of 2.708 by 70050000? Write the numbers 0.007005 and 70050000 in words.

5. Divide 283891.3 by 0.07084. What is the quotient of 2.838913 divided by 708.4?

6. From 1 sq. rd. 5 sq. ft. subtract 7 sq. yd. 139 sq. in. Divide £ 32 16 s. 3 d. by 7.

7. Reduce 44920.9025 hours to years (of 365 days), days, hours, minutes, and seconds.

8. Find the cube root of 0.61 to five places of decimals. Find the square root of 79000 to three places of decimals.

9. Reduce to their lowest terms as Vulgar Fractions the Infinite or Circulating Decimals  $0.00\dot{0}54$  and  $0.20\dot{0}54$ . Add  $0.\dot{0}3$  to  $0.4\dot{6}2$ , expressing the result as an Infinite or Circulating Decimal.

10. A certain sum of money was put at simple interest at 9 per cent, December 21, 1790. At what date did it become tripled?

## XV.

1. What is the Greatest Common Divisor of two numbers? of 4760 and 3432?

2. Subtract  $\frac{2}{3}$  of  $\frac{3}{4}$  from  $\frac{2}{3}$  of  $\frac{3\frac{1}{2}}{41}$ , add to the remainder  $\frac{5}{16}$ , divide the result by  $6\frac{1}{2}$ , and change the quotient to a decimal.

3. Divide 0.000647808 by 6.72. Write the quotient in words.

4. I owe three notes bearing interest from date: the first, dated June 1, 1866, is for \$450.00; the second, dated Dec. 17, 1866, is for \$750.00; the third, dated March 15, 1867,

is for \$600.00. I wish to substitute for these a single note for \$1800.00: what should be the date of it?

5. Find the square root of 0.9.
6. Find the cube root of 751089.429.
7. Find the cube of 4; of 0.4; of 0.0004.
8. A sum of money was put at interest, at  $7\frac{3}{10}$  per cent, October 30, 1866: at what date will it be tripled? (A year = 365 days.)
9. If 4 men dig a trench 84 feet long and 5 feet wide in 3 days of 8 hours each, how many men can dig a trench 420 feet long and 3 feet wide in 4 days of 9 hours each?
10. How many feet, board measure, in a plank 12 ft. 4 in. long, 2 ft. 5 in. wide at one end, 2 ft. 1 in. wide at the other, and 4 in. thick?
11. In what proportion shall sugars worth 7 and 12 cents a pound be taken to form a mixture worth  $9\frac{1}{3}$  cents a pound?

## XVI.

1. What is the Least Common Multiple of two or more numbers? of 48, 98, 21, and 27?
2. Add  $\frac{4\frac{1}{2}}{6\frac{3}{8}}$  and  $\frac{2\frac{1}{2}}{7\frac{1}{4}}$ ; divide the result by  $7\frac{1}{2}\frac{3}{4}$ , and change the quotient to a decimal.
3. A certain bank declares a semiannual dividend of 4 per cent: what can I afford to pay for its shares if I wish to get 6 per cent a year for my money?
4. Reduce .445 of an acre to rods, feet, and inches.
5. Divide 0.0018891 by 3.75. Write the quotient in words.
6. Find the cube root of 748613.312; of 0.27.

7. Find the square of 0.9; of three millionths. Write the results in words.

8. How many feet, board measure, in a plank 16 ft. 4 in. long, 1 ft. 7 in. wide, and  $4\frac{1}{2}$  in. thick?

9. A, B, and C hire a pasture for \$92. A pastures 6 horses for 8 weeks, B 12 oxen for 10 weeks, and C 50 cows for 12 weeks. Now, if 5 cows are reckoned as 3 oxen, and 3 oxen as 2 horses, how much shall each man pay?

10. If 496 men, in 5 days of 12 h. 6 m. each, dig a trench of 9 degrees of hardness, 465 feet long,  $3\frac{3}{4}$  feet wide, and  $4\frac{3}{8}$  feet deep, how many men will be required to dig a trench 2 degrees of hardness,  $168\frac{3}{4}$  feet long,  $7\frac{1}{2}$  feet wide, and  $2\frac{4}{5}$  feet deep, in 22 days of 9 hours each?

## XVII.

1. What is the Least Common Multiple of two or more numbers? What is the Least Common Multiple of 3150 and 2310?

2. From  $\frac{1}{4}$  of  $1\frac{3}{4}$  take  $\frac{\frac{3}{4}}{2\frac{1}{2}}$ , add to the remainder  $\frac{2}{3}$ , and divide the result by  $6\frac{3}{4}$ .

3. Divide 0.00091471 by 9.43. Write the quotient in words.

4. How many yards of carpet which is  $\frac{3}{4}$  of a yard wide does it require to cover a floor 17 feet long and 16 feet 6 inches wide?

5. Reduce 0.758762 acres to square rods, square feet, etc.

6. Find the square root of 0.002539 to five places of decimals.

7. Find the cube root of 0.15 to three places of decimals.

8. What is the interest of \$875.26 from October 10, 1866, to July 10, 1868, at  $7\frac{3}{10}$  per cent?



9. One metre (in Long Measure) = 39.37 inches. Express one foot in the metric system, both in Long Measure and in Square Measure.

## XVIII.

1. Find the Greatest Common Divisor and the Least Common Multiple of 340200, 583200, and 2268000.

2. From  $\frac{4}{21}$  of  $2\frac{2}{3}$  subtract the product of 0.075 and  $1\frac{1}{3}$ , and divide the remainder by 12. Reduce the result to its lowest terms as a Vulgar Fraction, and also to a decimal form.

3. Divide 10 times  $\left(\frac{7}{9} \text{ of } \frac{1\frac{1}{2}}{12\frac{1}{4}} \text{ of } 9\frac{9}{10}\right)$  by  $\frac{2\frac{1}{2}}{7\frac{1}{2}}$

4. Divide 189695.4 by 2.708. What is the quotient of 0.01896954 divided by 2.708? Write the latter quotient in words.

5. Reduce to their lowest terms as Vulgar Fractions the Infinite or Circulating Decimals  $0.00\dot{3}\dot{6}$  and  $0.01\dot{3}\dot{6}$ . Add  $0.0\dot{7}$  to  $0.38\dot{2}$ , expressing the result as an Infinite or Circulating Decimal.

6. A certain square field contains 38.75 acres. Compute the length of one side of the field in metres. Given one square metre = 1550 square inches.

7. The sum £ 46 6 s. 8 d. was put at interest at 4 per cent on the 20th June, 1868. Required the amount on the 5th May, 1875.

8. Find the cubic root of 77869 to three places of decimals.

9. At what rate of compound interest will \$ 2500 amount in 3 years to \$ 4320? At what rate of simple interest?

## XIX.

1. Reduce  $\frac{184800}{1180410}$  to its lowest terms. What is a

**Prime Number ?** When are two numbers said to be prime to each other ? Reduce the numerator and denominator of the above fraction to their Prime Factors.

2. From  $5\frac{1}{3}$  subtract  $\frac{3\frac{7}{8}}{3\frac{1}{3}} \div \left( \frac{8}{10} \text{ of } \frac{4\frac{1}{2}}{2\frac{1}{3}} \text{ of } 4\frac{1}{8} \right)$ .

3. Divide 33368949.63 by 0.007253. What is the quotient of 3336.894963 by 72530 ? What is the third power of 0.1 ? of 100 ? Write these answers in words.

4. Find the cube root of 0.0093 to five places of decimals. Find the square root of 531.5 to three places of decimals.

5. Reduce to their lowest terms as vulgar fractions the Infinite or Circulating Decimals  $0.\dot{2}2\dot{5}$ ,  $0.00\dot{2}2\dot{5}$ , and  $0.25\dot{2}2\dot{5}$ . Reduce  $\frac{3}{7}$  to a Circulating Decimal.

6. From 1 sq. rod 5 sq. ft. subtract 7 sq. yd. 139 sq. in.

7. Find the amount of £ 50 12 s. 5 ds. at simple interest at 8 per cent, at the end of 5 yrs. 2 mos. and 3 ds.

8. One metre = 39.37 inches. Compute from this datum the value of 4 miles in kilometres.

## XX.

1. Divide two thousand five hundred one and four tenths by four thousand one hundred twenty-five ten millionths. Divide 1.29136109 by 184.3, and write the quotient in words.

2. How do you divide one Vulgar Fraction by another ? Give the rule and the reason of the rule. Illustrate by an example.

3. From the sum of  $\frac{7\frac{1}{2}}{13\frac{1}{4}}$  and  $\frac{3\frac{7}{8}}{6\frac{2}{3}}$  subtract  $\frac{1\frac{1}{2}}{4}$ , and divide the result by the product of  $3\frac{1}{6}$  and  $2\frac{1}{3}$ .

4. Find the cube root of 10 to four places of decimals.

5. Find the square root of 0.0000001.
6. A merchant sold a quantity of goods for \$ 29900. He deducts five per cent from the amount of the bill for cash, and finds that he has made fifteen per cent. on the investment. What did he pay for the goods ?
7. What is the compound interest on £ 47 13 s. 6 d. for 3 yrs. 4 mos. 15 ds., at  $3\frac{1}{2}$  per cent ?
8. How many feet of board in a plank 17 ft. long, 22 inches wide at one end, 13 inches wide at the other, and 4 inches thick ?
9. Write the tables for Long Measure and Square Measure.

## XXI.

1. Reduce 179487 to the product of its Prime Factors.
2. Find the Greatest Common Divisor of 13212 and 1851.
3. To divide by a Vulgar Fraction : give the rule and the reason of the rule.
4. Find the sum of the following numbers : fifty-seven and three thousandths ; three hundred and sixty-four hundred thousandths ; forty-seven thousand and eight thousand and seven hundred thousandths ; eighty-seven hundred millionths ; four hundred and twenty-seven ten thousandths.
5. Divide  $(2\frac{1}{7} \times \frac{3}{16})$  by  $(2\frac{1}{4} - 1\frac{5}{7})$ , and reduce the result to a decimal.
6. What is the difference between Bank Discount and True Discount ? Give an example.
7. Bought \$ 1500 worth of goods, half on 6 months' and half on 9 months' credit. What sum at 7 per cent interest, paid down, would discharge the whole bill ?

8. Find the cube root of 0.29 to three places of decimals.
9. The interest on £ 50 12 s. 6 d. for a year is £ 1 15 s. 5½d. What is the rate per cent ?
10. A cubical vat measures 9 feet in each direction : what is its capacity in *Litres* ? (Given 1 metre = 39.37 inches.)
11. In the Metric System of Weights and Measures what is the unit of length ? of surface ? of volume ? of weight ? How are they related to each other ?

## XXII.

1. Divide four millionths by four millions, and write the quotient in words.
2. The metre = 39.371 inches : compare the kilometre with the mile.
3. Change  $\frac{5}{7}$  to a decimal, and extract the cube root to four places.
4. Express 38 sq. rods, 21 sq. yards, 5 sq. feet, 108 sq. inches, in decimals of an acre.
5. The capital stock of a certain bank is \$500,000, and directors have declared a dividend of 4 per cent. The sum set aside from the profits to meet this dividend is subject to a revenue tax of 5 per cent. What sum must be set aside in order that the stockholder may receive a dividend of 4 per cent on his stock ?
6. From  $\frac{4\frac{1}{2} \times 2\frac{5}{8}}{5\frac{1}{2} - 4\frac{1}{2}}$  subtract  $\frac{7\frac{1}{2}}{2\frac{1}{2}}$ .
7. A man has a bin 7 ft. long,  $2\frac{1}{2}$  ft. wide and 2 ft. deep, which contains 28 bushels of corn ; how deep must he build another, which is to be 18 ft. long, 1 ft.  $10\frac{1}{2}$  in. wide, in order to contain 120 bushels ? (Solve this question by analysis, and give your reasoning in full.)

8. What is the present worth of \$ 10,000, due three years hence, at 7 per cent compound interest ?

9. Find the Greatest Common Divisor of 1274, 2002, 2366, 7007, and 13013.

10. How do you verify your work when you have multiplied together two large numbers ? Give an example to illustrate your method.

## XXIII.

1. Find the Greatest Common Divisor and the Least Common Multiple of 13860 and 38500. What is the Least Common Multiple of 15, 18, and 35 ? When are two numbers said to be prime to each other ?

2. Divide  $\frac{45}{213}$  by  $\frac{2}{5}$  of  $\left(\frac{2}{14} - \frac{1}{4}\right)$ . Simplify by cancelling.

3. Reduce to its lowest terms as a Vulgar Fraction 0.05405. Reduce  $\frac{9}{28}$  to a Circulating Decimal.

4. Find the number of cubic inches (to the nearest tenth) in the British imperial gallon, which contains 10 pounds of water. Given 1 gramme = weight of 1 cubic centimetre of water, 1 cubic metre = 35.3 cubic feet, 1 kilogramme = 2.2 pounds.

5. Find the square root of 0.076 to six significant figures.

6. A rectangular field measures 30 rods and 6 feet by 21 rods and 11 feet. Find its area in acres, roods, rods, and feet.

7. Find the sum on which the interest at 9 per cent for 5 years 1 month and 18 days is \$ 947.10.

8. Find the interest on one pound sterling at 5 per cent for one year ; for one month.

## XXIV.

1. What is the Greatest Common Divisor of 1872 and 432 ? Obtain the answer, if possible, by factoring.

2. What is the smallest sum of money that can be made up either of 2-cent, of 3-cent, of 5-cent, of 10-cent, or of 25-cent pieces ?

3. Add  $\frac{2}{5}$  to  $\left(7\frac{1}{6} \div \frac{\frac{2}{3} \times 7\frac{1}{2}}{\frac{1}{3}}\right)$ .

4. By a pipe of a certain capacity a cistern can be emptied in  $3\frac{7}{15}$  hours ; in what time can it be emptied by a pipe the capacity of which is  $\frac{2}{3}$  greater ?

5. Find the value of 7 acres 35 rods 127 feet of land, at \$108.15 per acre.

6. How many litres are there in a rectangular vat 2.8 m. long, 2 m. wide, 5 dm. deep ?

7. Find the square root of 0.9 to four places of decimals.

8. My agent sells for me 2000 yards of cloth at 24 cents a yard. He allows the purchaser 5 per cent discount for cash, and charges me  $2\frac{1}{2}$  per cent on the cash receipts. How much money does he pay over to me ?

## XXV.

1. Find the Greatest Common Divisor of 187 and 153. Also the Least Common Multiple of the same two numbers.

2. Multiply 108 billionths by two thousand, and extract the cube root of the product.

3. Add  $\frac{2}{1\frac{1}{2}}$  to  $\frac{8\frac{1}{2} - 2\frac{1}{2}}{9}$ .

4. A cellar is to be dug 30 feet long and 20 feet wide : at what depth will 50 cubic yards of earth have been removed ?

5. What is the amount of \$340 at 8 per cent for 1 year 3 months, the interest being compounded semiannually ?

6. A man receives \$18 for six days' work of 8 hours

each ; what should he receive for 5 days' work of 9 hours each ?

7. A cistern is 4 metres long, 24 decimetres wide, and 80 centimetres deep. How much water will it hold in cubic metres ? In litres ? In cubic centimetres ? In grammes ? In kilogrammes ?

8. I have a rectangular lot of land, 64 rods long and 36 rods wide, and a square lot of the same area ; how many more feet of fencing will be needed for the former lot than for the latter ?

## XXVI.

1. Add  $\frac{17}{5}$  of  $\frac{4}{1\frac{1}{4}}$  to  $\frac{33}{1\frac{1}{2}}$ .

2. Multiply  $0.14\dot{5}$  by  $0.29\dot{7}$ , and give the answer as a Circulating Decimal.

3. Find the Greatest Common Divisor of 43700 and 9430. Also obtain their Least Common Multiple.

4. I buy one fifth of an acre of land for \$2178. For how much a square foot must I sell it, in order to gain twenty per cent of the cost ?

5. The kilogramme equals 2 lb. 8 oz. 3 dwt. 2 gr. How many centigrammes equal one grain ?

6. What is the present worth of \$678.75, due 3 years 8 months hence, at 7 per cent compound interest ?

7. Multiply the square root of 0.173056 by the cube root of  $\frac{15625}{82768}$ .

8. A can do a certain piece of work in 10 days, working 8 hours a day. B can do the same work in 9 days, working 12 hours a day. They decide to work together, and to finish the work in 6 days. How many hours a day must they work ?

## ALGEBRA.

## I.

1. MULTIPLY  $a^3 + 2a^2x + 2ax^2 + x^3$  by  $a^3 - 2a^2x + 2ax^2 - x^3$ .

2. Divide 1 by  $1 - m^2$ , finding five terms of the series.

3. Divide  $-6x^4 + 96$  by  $-3x + 6$ .

4. Divide  $\frac{4(x^2 - y^2)(a + b)}{3m^2}$  by  $2a(x + y)$ .

5. Find the greatest common divisor of numerator and denominator, and reduce the fraction  $\frac{x^4 - 1}{x^5 + x^3}$  to its lowest terms.

6. Divide  $\frac{ab - bx}{a + p}$  by  $\frac{ac - cx}{a + p}$ .

7. Reduce  $1 - \frac{a^2 - x^2}{a^2 + x^2}$  to the form of a fraction.

8. A farmer sells to one man 5 cows and 7 oxen for \$370, and to another, at the same rate, 10 cows and 3 oxen for \$355. Required, the price of a cow and that of an ox.

9. What is the fourth power of  $-3p^2q^2$ ?

10. What is the third root of  $-729a^6b^3c^{12}$ ?

11. Find  $(2a - b)^4$  by the Binomial Theorem.

## II.

1. Multiply  $a^6 + 3a^4b^2 - 5a^2b^4$  by  $7a^4 - 4a^2b^2 + b^4$ .

2. What is the value of  $-(10 - 3a^3)(10 + 3a^3)$ ?

3. Divide  $12a^4b^9 - 14a^5b^6 + 6a^5b^3 - a^7$  by  $2a^2b^3 - a^3$ .



4. Reduce  $\frac{x^4 - y^4}{(x^2 + y^2)(x^2 - 2xy + y^2)}$  to its lowest terms.
5. Reduce  $\frac{a}{b} + \frac{a - 3b}{cd} - \frac{b^2 + ab - a^2}{bcd}$  to its simplest form as a single fraction.
6. Divide  $\frac{10 a^3 x^2}{9 m^3 y^3}$  by  $\frac{5 a^7 x}{27 m y^2}$  and reduce the answer to its lowest terms.
7. Find the value of  $x$  in terms of  $a, b, c$ , from the equation  $\frac{2x - a}{b} = \frac{bc - cx}{a}$ . What does this value become when  $a = 2, b = -1$ , and  $c = 3$ ?
8. The sum of the distance passed over by two locomotives, the first running 6 hours and the second 4 hours, is 228 miles; but the second goes 24 miles more in 8 hours than the first goes in 12 hours. Find the distance each goes in an hour?
9.  $(-7x^2y^3)^2 = \text{what?}$   $\sqrt[3]{\left(-\frac{64a^3b^9}{c^6}\right)} = \text{what?}$
10. Find by the Binomial Theorem  $(a - b)^6$  and  $(1 - 3x^3)^6$ .

## III.

1. From  $5a^3b + 3b^2c - 7c^3de$  take  $-6a^2b - (4c^3de - 4b^2c)$ .
2. Multiply  $x^2 + xy + y^2$  by  $x^2 - xy + y^2$ .
3. Divide  $x^4 - y^4$  by  $x - y$ .
4. Reduce  $\frac{(x^2 - y^2)(x - y)}{(x + y)(x^2 + 2xy + y^2)}$  to its lowest terms.
5. Add together  $3x + \frac{2x}{5}$  and  $x - \frac{8x}{9}$ .
6. Multiply  $x - \frac{x + 2}{a}$  by  $x^2 - \frac{x^2 + 3}{b}$ .

7. Divide  $\frac{x(a+b)}{x-1}$  by  $\frac{a^2-b^2}{x^2-2x+1}$ .
8. Divide the number 75 into two such parts that three times the greater may exceed seven times the less by 15.
9. What is the fourth power of  $\frac{-ax^2}{b^3y}$ ?
10. What is the third root of  $\frac{-27b^9}{x^3}$ ?
11. Find  $(b-2c^3)^4$  by the Binomial Theorem.

## IV.

1. Reduce  $a+b-(2a-3b)-(5a+7b)-(-13a+2b)$  to its simplest form.
2. Multiply  $a^3+b^2-c$  by  $a^2-b^3$ .
3. Divide  $-1+a^3n^3$  by  $-1+an$ .
4. Reduce to one fraction  $\frac{a}{a+2}+\frac{2}{a-2}$ .
5. Multiply  $a+\frac{ax}{a-x}$  by  $x-\frac{ax}{a+x}$ .
6. Divide  $\frac{a^2+2ab+b^2}{x^4-y^4}$  by  $\frac{a^2-b^2}{x^2-y^2}$ .
7. How much money have I when the fourth and fifth part amount together to \$2.25.
8. Find the fifth power of  $-2a^2$ .
9. Find the fourth root of  $\frac{a^8b^{20}c^4}{16d^{12}z^{16}}$ .
10. Find  $(5a-4x)^4$  by the Binomial Theorem.

## V.

1. Reduce the following expression to its simplest form:  
 $ax+b(x+c)+c^2-[(a-b)x-(b-c)(b+c)]$ .
2. Multiply  $x+2y-3z$  by  $x-2y+3z$ .

3. Divide  $8a^2 - 12a^5 + 8a^4 + 18a^3 - 30$  by  $6 - 4a^2$ .
4. Combine  $\frac{3}{1-2x} - \frac{8}{1+2x} - \frac{20x-4}{1-4x^2}$  in a single fraction, and reduce it to its lowest terms.
5. Divide  $x^2 + \frac{1}{x^2} - 2$  by  $x - \frac{1}{x}$ .
6. Find  $(a - b)^4$  and  $\left(\frac{x}{y} - 2y^2\right)^4$  by the Binomial Theorem.
7. Solve the equation  $\frac{x}{a} - \frac{a}{a+b} = \frac{x}{a-b}$ , in which  $a$  and  $b$  denote known quantities. Find also the value of  $x$  when  $a = -1$   $b = 3$ .
8. Find a certain fraction which is such that if 3 be subtracted from both numerator and denominator, the value of the fraction becomes  $\frac{1}{2}$ , and that if 11 be added to both numerator and denominator, the value of the fraction becomes  $\frac{2}{3}$ .
9. Solve the equations  $2x - y = 5$ ,  $3y - 2z = -13$ ,  $2z - 4x = 2$ .
10. Verify the answers of Nos. 7, 8, and 9, by showing that they satisfy the original conditions.

## VI.

1. From  $6ac - 5ab + c^2$  subtract  $3ac - [3ab - (c - c^2) + 7c]$ .
2. Divide  $28a^2 - 6a^3 - 6a^5 - 4a^4 - 96a + 264$  by  $3a^2 - 4a + 11$ .
3. Reduce  $\frac{(a^2 - b^2)(a + b)}{(a - b)(a^2 + 2ab + b^2)}$  to its lowest terms.
4. From  $3x + \frac{x}{b}$  take  $x - \frac{x-a}{c}$ .

5. Divide  $\frac{x^4 - b^4}{x^2 - 2bx + b^2}$  by  $\frac{x^2 + bx}{x - b}$ , and reduce the answer to its lowest terms.

6. Multiply  $\left(-\frac{2a}{b^4c^3}\right)^4$  by  $\sqrt[3]{\left(-\frac{b^{15}}{8a^{18}c^3}\right)}$ .

7. Find  $(x - y)^5$  and  $(a^2 - 3b)^5$  by the Binomial Theorem.

8. Find a number from which if 5 be subtracted  $\frac{2}{3}$  of the remainder will be 40.

9. Solve the equations  $x - 6z = 6 - 2y$ ,  $3x - 5y = 20$ ,  $4z = 5x - 27$ .

10. Verify the answers to Nos. 8, 9, by showing that they satisfy the original conditions of those problems.

## VII.

1. From  $4a^2x - (2abc - 4bc + 8d)$  subtract  $8abc - (4a^2x - 2d) + abc$ .

2. Multiply  $x^2 + xy + y^2$  by  $x^2 - xy + y^2$ .

3. Divide  $3a^4 - 8a^2b^2 + 3a^2c^2 + 5b^4 - 3b^2c^2$  by  $a^2 - b^2$ .

4. Reduce  $\frac{(a^4 - b^4)(a^2 + 2ab + b^2)}{(a^2 - 2ab + b^2)(a^2 - b^2)(a + b)}$  to its simplest form by inspection.

5. From  $x - \frac{a + b}{2}$  take  $2x + \frac{a - b}{c}$ .

6. Divide  $\frac{a^2 - b^2}{a^2 + 2ab + b^2}$  by  $\frac{x(a - b)}{(a + b)^2}$ .

7. Divide  $\frac{\sqrt[3]{-64a^3b^3}}{c^3}$  by  $(-2a^2bc^3)^5$ .

8. Subtract  $(a - 2b)^5$  from  $(a + 2b)^5$ . Use the Binomial Theorem.

9. In a mixture of wine and cider one half the whole

plus twenty-five gallons was wine, and one third part minus five gallons was cider; how many gallons were there of each?

10. Solve the equations  $\frac{x}{7} + 7y = 99$ ,  $\frac{y}{7} + 7x = 51$ .

## VIII.

1. Reduce the following expression to its simplest form:  
 $(a + b)x - (b - c)c - [(b - x)b - (b - c)(b + c)] - ax$ .

2. Multiply  $2x^3 - 3xy + 6y^2$  by  $3x^2 + 3xy + 5y^2$ .

3. Divide  $40a + 8a^4 - 50a^2 - 8$  by  $5a - 2a^2 - 2$ .

4. Give the rule for multiplying different powers of the same quantity, and explain its reason. Example:  $x^m \times x^n =$  what?

5. Reduce the following expression to a single fraction, having the least possible denominator:  $\frac{1+x}{(1-x)^2} - \frac{4x}{1-x^2} - \frac{1-x}{(1+x)^2}$

6. Divide  $\frac{25a^2b^3x^2}{18c^3y^2}$  by  $-\frac{10ab^3}{27cxy^2}$

7. Find by the Binomial Theorem the first four terms of  $(a - b)^{20}$  and of  $\left(1 - \frac{2x}{5y^2}\right)^{20}$ .

8. Find the value of  $x$  in the equation  $x - a = \frac{bc}{d} + \frac{c^2x}{de}$ , in which  $a, b, c, d$ , and  $e$  denote known quantities. Find, also, what the value of  $x$  becomes when  $a = -3, b = 0, c = -2, d = -2, e = 4$ ; and verify it for this case by showing that it satisfies the equation.

9. A and B have together  $\frac{2}{3}$  as much money as C; B and

C have together 6 times as much as A; and B has \$ 680 less than A and C together have: how much has each? Eliminate by comparison; and verify the answers by showing that they satisfy the given conditions.

## IX.

1. Reduce the following expression to its simplest form:  $a b - c (x - b) - [(x + c) (x - c) - c (b - \{c - x\}) - x^2]$ .

2. Into what two factors can the following expressions be severally resolved:  $(4x^6y^2 - 25x^{16})$ ;  $(m^3 - n^8)$ .

3. Multiply  $6a^3 - 2a^2b + 4ab^2$  by  $2a^2b - 5ab^2 - 3b^3$ .

4. Divide  $9x^3 - 6x^4 - 45x + 3x^2 + 54$  by  $3x + 3x^2 - 9$ .

5. State the rule for multiplying different powers of the same quantity, and give its reason. Examples:  $x^m \times x^n =$  what?  $(x^m \times x^n)^p =$  what?

6. Reduce to one fraction (with least possible denominator)  $\frac{3}{(1-x)^2} + \frac{2}{1-x} + \frac{2}{1+x} - \frac{1}{1-x^2}$ .

7. Divide  $\frac{4a^3b^5}{21c^2d^8}$  by  $-\frac{2cb^5}{3a^2d^{10}}$ ; and raise the quotient to the second power.

8. A and B are building a wall. A alone can build it in  $a$  days, and B alone in  $b$  days. In what time can both together build it?

9. Solve the equations  $\frac{1}{2}x + \frac{1}{4}y = \frac{1}{5}z - 1$ ,  $2z - \frac{1}{2}y = 28 - \frac{3}{8}x$ ,  $\frac{4x + 3z}{2} = y + 5$ .

10. Solve the equation  $x^2 - 5x - 6 = 0$ ; and verify the answers by showing that they satisfy the equation.

11. Show that no binomial can be an exact second power.

## X.

1. Reduce the following expression to its simplest form :

$$x^3y^2 - \left(-xy^2 + x^3 - \frac{x^4}{y}\right)xy - x^2[-\{y^3 - y(xy - x^2)\}].$$

2. Reduce the following expression to its simplest form :

$$(a+b)b + c - [(c+d)(a+d) - c(a+b-1) - (a+c)(d-b)].$$

3. Multiply  $15a^2 + 18ab - 14b^2$  by  $4a^2 - 2ab - b^2$ .

4. Divide  $43x^2y^2 - 22x^3y + 24y^4 + 8x^4 - 38xy^3$  by  $3xy - 2x^2 - 4y^2$ .

5. From  $\frac{1+m^2}{1-m^4}$  take  $\frac{1-m^2}{1+m^2}$ .

6. Divide  $\frac{a+x}{a-x} + \frac{a-x}{a+x}$  by  $\frac{a+x}{a-x} - \frac{a-x}{a+x}$ ; and reduce the quotient to its lowest terms.

7. Divide  $\frac{6a^2c^7}{45b^3c^5}$  by  $\frac{9a^3b}{20c^2}$ ; and find the second power and the third root of the quotient.

8. Reduce to one fraction  $\frac{a+b}{(b-c)(c-a)} - \frac{b+c}{(a-c)(a-b)} + \frac{a+c}{(b-a)(c-b)}$ . What is the Least Common Denominator in this example?

9. State the rule for multiplying different powers of the same quantity, and give its reason.  $x^m \times x^n =$  what?  $(x^m \times x^n)^3 =$  what?  $(a^2b)^m = ?$   $\sqrt{\left(\frac{a^{m+n}}{a^{m-n}}\right)} = ?$  What is denoted by  $a^{\frac{1}{2}}$ ?

10. What is the reason that any term may be transposed from one member of an equation to the other, provided its sign is changed?

11. Solve the equation  $\frac{x}{a} - \frac{a}{a+b} = \frac{x}{a-b}$ . What is the value of  $x$  if  $a = -2$ ,  $b = 3$ ?

12. Out of a cask of wine from which a third part had leaked away, 21 gallons were afterwards drawn, and the cask was then half full. How much did it hold?

13. Solve the equations  $3x - 5y = 63$ ,  $\frac{1}{2}x + \frac{2}{3}y = -3$ .

14. Solve the equations  $x + y - z = 29$ ,  $x - 2y + 3z = -46$ ,  $\frac{1}{2}x - \frac{1}{3}y - \frac{1}{4}z = 4$ .

15. Solve the equation  $x^3 - 3x - 10 = 0$ , and verify the answers by showing that they satisfy the equation.

16. Find four terms of  $(a - b)^{25}$  and of  $\left(\frac{x^2}{y} - xy^2\right)^{25}$  by the Binomial Theorem.

## XI.

1. Reduce the following expression to its simplest form:  
 $(a + b)x - (b - c)c - [(b - x)b - (b - c)(b + c)] - ax$ .

2. Multiply  $x^5 + 3x^4y^2 - 5x^3y^4$  by  $7x^4 - 4x^2y^2 + y^4$ .

3. Divide  $23a - 30 - 7a^3 + 6a^4$  by  $3a - 2a^2 - 5$ .

4. What is the reason that when different powers of the same quantity are multiplied, their exponents are added?

5. Reduce to one fraction, with least possible denominator,  
 $\frac{1+x}{(1-x)^2} - \frac{4x}{1-x^2} - \frac{1-x}{(1+x)^2}$

6. Divide  $\frac{10a^3x^3}{9b^2y^2}$  by  $\frac{5ax^7}{27b^2y}$ , and reduce the answer to its lowest terms.

7. A had twice as much money as B, A gained \$30 and B lost \$40, whereupon A gave B  $\frac{2}{10}$  as much as B had left.



A then had what he had in the beginning and 20 per cent more. How much had each in the beginning?

8. Solve the equations  $5y - 8x = -280 - 30z$ ,  
 $x - 20 = z - y$ ,  $20z - 4x = 5y$ .

9. Solve the equation  $2x^2 - 7x + 3 = 0$ ; and verify the answers by showing that they satisfy the equation.

## XII.

1. Reduce the following expression to its simplest form:  
 $(a^2 - b^2)c - (a - b)(a[b + c] - b[a - c])$ .

2. Multiply  $3x^5y^3 - 6x^2y^3z + y^3$  by  $3x^5y^2 + 6x^2y^2z - y^3$ .

3. Divide  $9a^2 + 1 - 4a^4 - 6a$  by  $1 + 2a^2 - 3a$ .

4. What is the reason that when different powers of the same quantity are multiplied together, their exponents are added?

5. Reduce  $\frac{x^4 - y^4}{(x^2 + y^2)(x^2 - 2xy + y^2)}$  to its lowest terms.

6. Reduce to one fraction with the least possible denominator  $\frac{a}{b} - \frac{b^2 - a^2 + ab}{bcd} - \frac{3b - a}{cd} + \frac{c}{bd}$

7. Divide  $\frac{6x^3y}{35m^6z^3}$  by  $\frac{14y^3z^3}{15m^2x^3}$ ; and reduce the answer to its lowest terms.

8. Find the value of  $x$ , in terms of  $a$ ,  $b$ , and  $c$ , in the equation  $\frac{a - 2x}{b} = \frac{cx - bc}{a}$ . What does this value become when  $a = 2$ ,  $b = -1$ ,  $c = 3$ ?

9. Solve the equations  $\frac{3}{4}x + 2y + 3\frac{1}{2}z = 80$ ,  $4\frac{3}{4}y - z - \frac{3}{4}x = 108$ ,  $5z + 18x - 7y = 11$ .

10. Solve the equation  $x^2 = 4x + 60$ ; and verify the answers by showing that they satisfy the original equation.

## XIII.

1. Free the following expression from parentheses and reduce it to its simplest form:  $(x + a) a + y - [(y + b)(x + b) - y(x + a - 1) - (x + y)(b - a)]$ .

2. Divide  $24x^8y^2 + 21x^2y^8 - 9x^{10} + 4x^4y^6$  by  $2x^4y^2 - 3x^2y^4 - 3x^6$ .

3. What is the reason that when different powers of the same letter are multiplied the exponents are added?

4. Resolve the following expression into a single fraction (finding the least common denominator, and reducing the answer to its lowest terms):  $\frac{4a^2 + 3ab}{4a^2 - 3ab} - 1 - \frac{48a^3b}{16a^4 - 9a^2b^2}$

5. Divide  $\frac{15m^3x^5}{14y^4z^7}$  by  $-\frac{3m^6z^2}{8x^8y}$ .

6. Having a certain sum of money in my pocket, I lost  $c$  dollars, afterwards spent one  $a$ th part of what remained, and then found that what I had left was one  $b$ th part of what I had had at the beginning. Find the original sum. What does the answer become if  $a = 3$ ,  $b = 9$ ,  $c = 5$ ?

7. Solve the equations  $8x + \frac{3}{4}y - 5z = 0$ ,  $12z - 19 = 7x$ ,  $y - 7 = 12 - 8z$ . (If any answers are fractional, reduce them to their lowest terms.)

8. Solve the equation  $2x^2 - x - 21 = 0$ . Verify each answer by substituting it in the original equation.

9. Find, by the Binomial Theorem,  $(a - b)^5$ ,  $(2x - y^2)^5$ .

## XIV.

1. Free the following expression from parentheses, and reduce it to its simplest form:  $(a - b + c)^2 - (a[c - a - b] - [b\{a + b + c\} - c\{a - b - c\}])$ .

2. Divide  $5xy^3 - 7x^3y + 10x^4 - 24y^4$  by  $xy - 3y^2 - 2x^2$ .

3. What is the reason that when different powers of the same letter are multiplied the exponents are added ?

4. Resolve the following expression into a single fraction (finding the least common denominator, and reducing the answer to its lowest terms):  $\frac{3+2x}{2-x} - \left( \frac{2-3x}{2+x} - \frac{(16-x)x}{x^2-4} \right)$ .

5. Divide  $\frac{4(a^2-ab)}{b(a+b)^2}$  by  $\frac{6ab}{a^2-b^2}$

6. Solve the equation  $a - \frac{1+x}{1-x} = 0$ .

7. A gentleman has two horses and one chaise. The first horse is worth  $a$  dollars less than the chaise, and the second horse  $b$  dollars less than the chaise. If  $\frac{3}{4}$  of the value of the first horse be subtracted from that of the chaise, the remainder will be the same as if  $\frac{7}{8}$  of the value of the second horse is subtracted from twice that of the chaise. Find the value of each horse and that of the chaise. What are the answers, if  $a = -50$ ,  $b = 50$  ?

8. Solve the equations  $5y - 2x = 4z + 13\frac{1}{2}$ ,  $\frac{4}{3}x = \frac{z-40}{4}$ ,  $2x - y + 6z = 0$ . (If any answers are fractional, reduce them to their lowest terms.)

9. Solve the equation  $18x^2 - 33x - 40 = 0$ . Verify each answer by substituting it in the original equation.

10. Find  $(a-b)^7$  by the Binomial Theorem.

## XV.

1. Reduce to its simplest form the expression  $a - c - \frac{b - (c - d)e}{e}$ .

2. Solve the equation  $-3x^2 + 5x = 2$ .

3. Find the values of the unknown quantities in the equations  $x + 2y = 11$ ,  $2x + 3z = 13$ ,  $3y - 2z = 7$ .

4. What are similar terms? What is the rule for multiplying together different powers of the same letter? For dividing? By the rule, what do you get for the exponent of  $a$  in the quotient of  $a^5 \div a^3$ ,  $a^4 \div a$ ,  $a^2 \div a^2$ ,  $a^3 \div a^5$ ? When is the square of a number larger than the number itself? How do you raise fractions to powers,  $\left(\frac{a}{b}\right)^2$ ,  $\left(\frac{a}{b^2}\right)^2$ , for example?

5. Separate  $x^8 - y^8$  into prime factors.

6. A can do a piece of work in  $a$  days, B in  $b$  days, C in  $c$  days. In how many days can A and B together do it? B and C together? A and C together? All three together?

7. Find the value of  $x$  in the equation

$$x = \frac{\frac{ab}{a^2 - b^2}}{\frac{a + b}{a - b} - \frac{a - b}{a + b}}, \text{ in its simplest form.}$$

8. If I buy a certain number of pounds of beef at 25 cents a pound, I shall have 25 cents left; if I buy the same number of pounds of lard at 15 cents a pound, I shall have \$1.25 left. How much money have I?

## XVI.

1. Reduce to its simplest form the expression  $\frac{1 + \frac{n-1}{n+1}}{1 - \frac{n-1}{n+1}}$ .

2. Solve the equation  $-2x^2 + 7x - 3 = 0$ .

3. Find the values of the unknown quantities in the

equations  $y - \frac{z}{3} = \frac{x}{5} + 5$ ,  $\frac{x-1}{4} - \frac{y-2}{5} = \frac{3-z}{10}$ ,  $x - \frac{2y-5}{3} = 1\frac{z}{4} + \frac{z}{12}$ .

4. Separate  $a^8 - b^8$  into prime factors.

5. A and B can do a piece of work in  $a$  days, A and C in  $b$  days, B and C in  $c$  days. In how many days could each person do it?

6. What is the rule for multiplying together different powers of the same letter? For dividing? Explain the reason. Multiply  $a^5$  by  $a^2$ ;  $a^m$  by  $a^n$ . Divide  $a^5$  by  $a^2$ ;  $a^2$  by  $a^5$ ;  $a^3$  by  $a^3$ ;  $a^m$  by  $a^n$ ;  $6a$  by  $2a$ .

7. Divide  $x^5 - y^5$  by  $x - y$ .

8. Find the seventh power of  $3a - 2b$  by the Binomial Theorem.

## XVII.

1. Reduce the following expression to its simplest form:  $(x^2 + y^2)z - (x + y)(x[z - y] - y[z - x])$ .

2. What is the reason that, when different powers of the same quantity are multiplied together, the exponents are added?  $x^{m+n} \times x^{m-n} = \text{what?}$   $x^{m+n} \div x^{m-n} = \text{what?}$  Give the square root of each of these results.

3. Resolve the following expression into a single fraction (finding the least common denominator, and reducing the answer to its lowest terms):  $\frac{4x^2}{x^2 - y^2} - \frac{x - y}{x + y} - 1$ . What is the most reduced value of  $\frac{100a^4b^3}{25a^4b^3 - 9b^6} - \frac{5a^2b - 3b^3}{5a^2b + 3b^3} - 1$ ?

4. Divide  $\frac{24a^3x^2y^3}{35b^4}$  by  $\frac{32x^2y^3}{25a^2b}$ .

5. The owners of a certain mill make  $a$  dollars a day each, sharing equally. If the number of owners were  $b$  less, they would make  $c$  dollars each. Required the number of owners and the total daily profit of the mill. What are the answers if  $a = 80$ ,  $b = -3$ ,  $c = 50$ ?

6. Solve the equations  $37 + \frac{1}{3}x - 12y = 8z + 55$ ,  
 $\frac{2}{3}y = \frac{9-z}{9}$ ,  $x = 4z$ .

7. Solve the equation  $\frac{2}{1-x} - 1 = \frac{2}{3x}$ .

8. Find  $(a-b)^5$  and  $\left(\frac{2x^2}{y} - y\right)^5$  by the Binomial Theorem.

## XVIII.

1. Reduce the following expression to its simplest form:  
 $(a+b)a - ((a-b)^2 - (b-a)b)$ .

2. Separate  $n^5 - n$  into its prime factors.

3. From  $\frac{1+x^2}{1-x^2}$  subtract  $\frac{1-x^2}{1+x^2}$  and divide the result by  
 $\frac{4x}{1+x^2}$

4. "In multiplication and division, like signs give *plus* and unlike signs give *minus*." Explain fully why this is so.

5. A can perform a piece of work in  $a$  days, B can perform the same in  $b$  days, and C in  $c$  days. In how many days will the work be performed if they all labor together?

6. Solve the equations  $y + \frac{z}{3} = \frac{x}{5} + 5$ ,  $\frac{x-1}{4} - \frac{y-2}{5}$   
 $= \frac{z+3}{10}$ ,  $x - \frac{2y-5}{3} = 2$ .

7. Solve the equation  $\frac{90}{x} - \frac{90}{x+1} - \frac{27}{x+2} = 0$ .
8. Find  $(a+b)^5$  and  $\left(1 - \frac{2}{3}x^3\right)^5$  by the Binomial Theorem.

## XIX.

1. Reduce the following expression to its simplest form:  
 $(9a^2b^2 - 4b^4)(a^2 - b^2) - (3ab - 2b^2)(3a[a^2 + b^2] - 2b[b^2 + 3ab - a^2])b$ .

2. Divide  $36x^2 + 1 - 64x^4 - 12x$  by  $6x - 1 - 8x^2$ .

3. What is the reason that when different powers of the same quantity are multiplied together their exponents are added?

4. Reduce to one fraction with the lowest possible denominator  $\frac{3a+2b}{a+b} - \frac{25a^2-b^2}{a^2-b^2} - \frac{a}{2b}$ .

5. Divide  $\frac{x+y}{x^2-2xy+y^2}$  by  $\frac{x^2+xy}{x-y}$ , and reduce the answer to its lowest terms.

6. Find  $x$  in terms of  $a$ ,  $b$ , and  $c$ , from the equation  $\frac{a-2x}{b} = \frac{cx-bc}{a}$ . What is the value of  $x$  when  $a=2$ ,  $b=-1$ ,  $c=3$ ?

7. A man bought a watch, a chain, and a locket for \$216. The watch and locket together cost three times as much as the chain, and the chain and locket together cost half as much as the watch. What was the price of each?

8. Solve the equation  $\frac{5x}{x+12} - \frac{8-3x}{3x-1} = 1$ .

9. Find  $(a-b)^6$  and  $\left(xy - \frac{x^2}{2y}\right)^6$  by the Binomial Theorem.

## XX.

1. Separate into prime factors  $x^5 - x$ .
2. Reduce to its simplest form  $3a^5 - 4a^3 + 2b - ca^3(a^2 - 1) + \{2b - [7a^5 - a^3(4 - c) - a^5(4 + c)]\}$ .
3. Divide  $x^2 + \frac{x^4}{a^2 - x^2}$  by  $\frac{ax}{a - x} - x$ , and subtract the quotient from  $\frac{a^3}{a - x}$ .

4. It is said that when a term is transposed from one member of an equation to the other, its sign should be changed. Why is this so?

5. A reservoir is supplied by two pumps. Both pumps were worked three hours and the reservoir was found to be half full. On another occasion the larger pump was worked two hours and the smaller seven hours, when the reservoir was found to be two thirds full. How many hours required by either pump alone to fill the reservoir?

6. A laborer, having built 105 rods of stone fence, found that if he had built two rods less a day he would have been six days longer in completing the job. How many rods a day did he build?

7. What is Elimination? Describe fully the several processes by which it can be effected, and illustrate by examples of your own selection.

8. What is the Binomial Theorem? Find the seventh power of  $\frac{1}{2}a - 4bc$  by aid of it.

## XXI.

1. Reduce to its simplest form the following expression:  
 $(a + b)x - (b - c)c - [(b - x)b - (b - c)(b + c)] - ax$



2. Divide  $\frac{25a^2b^3x^2}{18c^2y^2}$  by  $-\frac{10ab^3}{27cxy^2}$ .
3. Divide  $8a^4 - 22a^3b + 43a^2b^2 - 38ab^3 + 24b^4$  by  $2a^2 - 3ab + 4b^2$ .
4. Separate  $a^8 - x$  into its prime factors.
5. Reduce to its simplest form the following expression :  

$$\left(\frac{1}{m} + \frac{1}{n}\right)(a + b) - \left(\frac{a + b}{m} - \frac{a - b}{n}\right).$$
6. Find, by the Binomial Theorem, the sixth term in the development of  $(a - b)^{18}$ ; and the fourth term in the development of  $\left(2x - \frac{3x^2}{4y}\right)^7$ .
7. Find the values of  $x$ ,  $y$ , and  $z$ , from the equations  

$$\frac{3y - 1}{4} = \frac{6z}{5} - \frac{x}{2} + 1\frac{1}{2}, \quad \frac{5x}{4} + \frac{4z}{3} = y + \frac{5}{6}, \quad \frac{3x + 1}{7} - \frac{z}{14} + \frac{1}{6} = \frac{2z}{21} + \frac{y}{3}.$$
8. A person performs a journey of 192 miles in a certain number of days; had he travelled 8 miles more a day he would have performed the journey in two days less time. Find how many days it took him to perform the journey.
9. Solve the equation  $(x - 1)(x - 2) = 6$ , and verify the results.

## XXII.

1. Reduce to its simplest form the expression  $a - (2b + [3c - 3a - (a + b)] + 2a - (b + 3c))$ .
2. Separate into its prime factors the expression  $x^6 - y^6$ .
3. Divide  $(a^2 - bc)^3 + 8b^3c^3$  by  $a^2 + bc$ .
4. Solve the equation  $(a + x)(b + x) = (c + x)(d + x)$ .
5. A can build a wall in one half the time that B can; B can build it in two thirds of the time that C can; all to-

gether they can build it in 6 days: find the time it would take each alone.

6. Solve the equations  $\frac{2}{x} + \frac{1}{y} = \frac{3}{z}$ ,  $\frac{3}{z} - \frac{2}{y} = 2$ ,  $\frac{1}{x} + \frac{1}{z} = \frac{4}{3}$ .

7. Solve the equation  $\frac{x+2}{x-1} - \frac{4-x}{2x} = \frac{7}{3}$ .

8. The length of a rectangular field exceeds the breadth by one yard, and the area is three acres; find the dimensions.

9. Expand the expression  $(2a + \frac{1}{b^2})^7$ .

10. What is Elimination? How many methods are you familiar with? Explain them in full.

### XXIII.

1. Simplify  $(a+b)(b+c) - (c+d)(d+a) - (a+c)(b-d)$ .

2. Reduce to its simplest form  $\frac{a^4 - x^4}{a^2 - b^2} \times \frac{a+b}{a^2 + x^2} \times \frac{a-b}{a-x}$ .

3. Find the first four terms of  $(\frac{a^2}{2x} - \frac{\sqrt{x}}{3})^{10}$ .

4. Find a number such that three times its square diminished by five times the number itself shall amount to 50. Solve completely.

5. What fraction is that which becomes equal to  $\frac{2}{3}$  when 6 is added to its numerator, and equal to  $\frac{1}{2}$  when 2 is subtracted from its denominator?

6. Solve the equation  $\frac{2x-3}{3x-5} = \frac{5}{2} - \frac{3x-5}{2x-3}$ .

7. A and B find a purse of dollars. A takes out 2 dol-

lars and  $\frac{1}{6}$  of what remains; B takes out 3 dollars and  $\frac{1}{6}$  of what then remains. They find that each has taken out the same amount. How many dollars were there in the purse?

8. Solve the equations  $7x - 3y = a$ ,  $5x - 11y = a$ ,  $9y - 5z = a$ .

## XXIV.

1. Find the value of  $a + 2x - \{b + y - [a - x - (b - 2y)]\}$  when  $a = 2$ ,  $b = 3$ ,  $x = 6$ , and  $y = 5$ .

2. Divide  $\frac{1}{8} - 6a^2 + 27a^4$  by  $\frac{1}{8} + 2a + 3a^2$ .

3. Reduce to its lowest terms  $\frac{x^4 - a^4}{x^5 - a^2x^3}$ .

4. Find both roots of the equation  $\frac{90}{x} - \frac{90}{x+1} - \frac{27}{x+2} = 0$ .

5. Expand, by the Binomial Theorem,  $(m - n)^5$  and  $(\sqrt{a} - \frac{2b}{3})^5$ .

6. Solve the equations  $y + \frac{z}{3} = \frac{x}{5} + 5$ ,  $\frac{x-1}{4} - \frac{y-2}{5} = \frac{z+3}{10}$ ,  $x - \frac{2y-5}{3} = \frac{7}{4} - \frac{z}{12}$ .

7. A man hires a certain number of acres of land for \$336. He cultivates 7 acres for himself, and lets the rest for \$4 an acre more than he pays for it. He receives for the portion that he lets what he pays for the whole, or \$336. Find the number of acres.

8. The value of a fraction, if its numerator is doubled and its denominator increased by 7, is  $\frac{2}{3}$ ; while, if its denominator is doubled and its numerator increased by 2, its value is  $\frac{3}{4}$ . What is the fraction?

## XXV.

1. A certain piece of work can be done by A and B working together in  $3\frac{1}{2}$  days, by B and C in  $4\frac{1}{2}$  days, and by C and A in 6 days. Required the time in which either can do it alone, and the time in which all can do it together.

2. Solve the equation  $\frac{2+x}{2-x} - \frac{1-x}{1+x} = \frac{9}{5}$ .

3. Solve the equation  $x^2 - (a - b + c)x = (b - a)c$ .

4. Divide  $1 - \frac{ax + b^2}{a^2 + ax}$  by  $\frac{a^2 - (b - 2x)b + 2b^2}{a + x} - 2b$ ,

and reduce the result to its lowest terms.

5. Divide  $9a^{2n} - a^{2n} - 27a^n + 27$  by  $a^n - 3$ .

6. Divide  $\sqrt[4]{\frac{a}{b}}$  by  $\sqrt{\frac{b}{a}}$ .

7. What is the reason that  $a^m a^n = a^{m+n}$ ?

## XXVI.

1. Solve the equation  $x - 3 = 4x - \frac{15 - x}{x}$ .

2. What are the three methods of Elimination? Solve the following equations by any two of the three methods:  $6x + \frac{1}{2}y = 0$ ,  $2(4x - 1) = 3(y - 8)$ .

3. M's age is to N's as  $a$  is to  $b$ ; but  $c$  years ago M's age was to N's as  $a'$  to  $b'$ . Required the present ages of both.

4. Divide  $1 - \frac{2}{x} \times \frac{1-x}{x-3}$  by  $\frac{x^2 - 5x}{(x-3)(x+2)} - x$ ; and reduce the answer to its lowest terms. Simplify the division by cancelling.

5. Find the fourth term of  $\left(a^2b - \frac{\sqrt{b}}{2a}\right)^7$ .

## ADVANCED ALGEBRA.

## COURSE II.

## I

1. FIND the greatest common divisor of  $a^6 - a^2x^4$  and  $a^6 + a^5x - a^4x^2 - a^3x^3$ .

2. Divide  $a^{\frac{3n}{2}} - a^{\frac{-3n}{2}}$  by  $a^{\frac{n}{2}} - a^{\frac{-n}{2}}$

3. Multiply  $\frac{a}{b} \sqrt{\frac{c}{d}}$  by  $\frac{x}{y} \sqrt{\frac{d^3}{c^2}}$ .

4. Divide 14 into two parts such that the quotient of the greater divided by the less shall be to the quotient of the less divided by the greater as 16 to 9.

5. Solve the equation  $\sqrt{x+8} + \sqrt{x+3} = \sqrt{x}$ .

6. The sum of two numbers is 17; and twice the square of the first, increased by 30, is equal to 3 times the square of the second. Find the numbers.

7. Explain the method of inserting a given number of arithmetical means between two given terms.

8. Find the sum of an infinite number of terms of the series  $4, \frac{1}{2}, \frac{3}{4}, \&c.$

9. What is the seventh term in the expansion of  $(a - x)^{10}$ ?

10. A and B have the same number of horses. A can make up twice as many teams, taking 3 horses at a time, as B can make up, taking 2 at a time. Find the number of horses.

## II.

1. Find the least common multiple of  $x^3 - x$ ,  $x^3 - 1$ , and  $x^3 + 1$ . Obtain the result, if possible, by factoring.

2. Simplify  $(a^{\frac{1}{2}} \times a^{\frac{1}{3}})^{\frac{1}{12}}$ .

3. Add together  $\sqrt[3]{40}$ ,  $\sqrt[3]{135}$ ,  $\sqrt[3]{625}$ .

4. Find both roots of the equation  $2x + \sqrt{5x + 10} = 11$ .

5. What two numbers are those whose difference is to the less as 4 to 3, and whose product multiplied by the less is 504?

6. What is the 4th term in the expansion of  $(c - \frac{d}{4})^9$ ?

7. The difference of two numbers is 3, and the difference of their cubes is 63. What are the numbers?

8. Obtain the formula for the sum of the terms of an Arithmetical Progression.

9. Find the sum of the series  $2, \frac{2}{3}, \frac{2}{9}$ , to infinity.

10. How many arrangements can be made of the letters in the word *Richmond*, taking four letters in a set?

## III.

1. Reduce the following expression to its simplest form:  
 $a^2 - [2ab - \{bc - (a + b - c)(a - (b - c))\} + 3ab] - (b + c)^2$ .

2. State and prove the rule for the *sign* of a power and of a root. How do *imaginary* quantities arise?

3. What is denoted by  $a^0$ ? by  $a^{-2}$ ? by  $a^{\frac{2}{3}}$ ?

4. Reduce  $1 - \frac{\frac{x}{x-1} - 1}{1 - \frac{x}{x+1}}$  to its simplest form.

5. Solve the equation  $ax^2 + 2hx + b = 0$ ; and prove that the product of the roots  $= \frac{b}{a}$ .

6. There are seven numbers in Arithmetical Progression such that the sum of the 1st and 5th is 16, and the product of the 4th and 7th is 160. Find the numbers. (This question admits two solutions. Both are required.)

7. Multiply  $1 - 5\sqrt[3]{7}$  by  $-2 - 3\sqrt[3]{7}$ . Divide  $\frac{\sqrt[3]{a}}{a^2\sqrt[3]{c}} \sqrt[3]{\frac{b}{a^2}}$  by  $\frac{a\sqrt[3]{a^5}}{ca\sqrt[3]{c}}$ .

8. Find the sixth term of  $\left(\frac{2a}{b^2} - \frac{1}{3}b\sqrt[3]{a}\right)$ .

9. Find the greatest common divisor and the least common multiple of  $6x^3 - 6x^2 - 72x$  and  $4x^4 - 16x^3 - 84x^2$ .

#### IV.

1. Extract the cube root of  $64 - 96x - x^3 + 40x^3 - 6x^5$ .

2. Solve the equation  $\frac{x+2}{x-1} - \frac{4-x}{2x} - 3\frac{1}{2} = 0$ .

3. Multiply together  $2 + 3\sqrt{-1}$ ,  $3 - 2\sqrt{-1}$ , and  $12 - 5\sqrt{-1}$ .

4. Three times the product of two numbers, diminished by the square of the first, equals the square of the second plus one. Also the first number is greater by one than twice the second. Find the numbers. (Give both solutions.)

5. Solve the equation  $ax^2 + bx + c = 0$ , and state

what *relative* values of  $a$ ,  $b$ , and  $c$  will make the roots equal, and what values will make them imaginary.

6. In an Arithmetical Progression, given the number of terms, the common difference, and the sum of the terms; — obtain formulas for the first term and the last.

7. In a Geometrical Progression the first term is  $2\frac{1}{2}$ , and the fifth term is  $\frac{4}{3}$ . Find the sum of the series to infinity.

8. Find the sixth term of  $\left(\sqrt{\frac{a}{bc}} - \frac{\sqrt{c}}{3ab}\right)^7$ .

9. How many whole numbers of four figures each can you form, each number either beginning or ending with 5, and no number containing the same figure twice?



## PLANE GEOMETRY.

## I.

1. DEFINE a Surface, a Plane, a Plane Figure, a Polygon. Mention all the different kinds of quadrilaterals.

2. Prove that if two angles of a triangle are equal, the sides opposite these angles are also equal.

3. How many degrees in each interior angle of a regular decagon? State and prove the proposition which enables you to answer this question.

4. What is the measure of an angle made by two tangents? by two chords which intersect? by two chords which do not intersect? by a tangent and a chord drawn through the point of contact? Draw a figure for each case.

5. What is the length of the longest line that can be drawn through a rectangular block of marble 12 feet long, 4 feet wide, and 3 feet thick?

6. On a given line as chord, to construct an arc of a given number of degrees.

7. Two tangents drawn to a circle make with each other an angle of 60 degrees; how many degrees of arc between the two points of contact?

8. What is meant by the equation  $\pi = 3.1416$ ? Calculate the difference in area between a circle whose diameter is 20, and the square inscribed in it.

9. Construct a triangle, having given the base, an adjacent angle, and the altitude.

## II.

1. Define a Point ; a Surface ; a Plane ; an Angle. What is assumed as the measure of angles ?

2. Prove that when two oblique lines are drawn at unequal distances from the perpendicular, the more remote is the greater.

3. Prove that when the opposite sides of a quadrilateral are equal, the figure is a parallelogram.

4. Two angles of a triangle being given, to find the third by geometric construction.

5. What is the measure of an inscribed angle ? State and prove.

6. Two tangents drawn to a circle make with each other an angle of  $20^\circ$  ; how many degrees of arc between the two points of contact ?

7. The side of an equilateral triangle is 12 ; what is its altitude ?

8. Construct a triangle, having given the base and adjacent angle, and the altitude.

## III.

1. Define a Right Angle, a Perpendicular, Parallel Lines. On what does the magnitude of an angle depend ? What arc is assumed as the usual measure of an angle ? Why ?

2. To inscribe a circle in a given triangle.

3. Prove that two triangles are equal if the three sides of one are equal respectively to the three sides of the other.

4. Define Similar Polygons.

5. To find a mean proportional between two given lines. Prove the theorem on which your solution depends.

6. Prove that every equilateral polygon inscribed in a circle is regular.

7. The ratio of the squares described on the two legs of a right triangle is equal to the ratio of what two lines?

8. To construct a square which shall be to a given square in a given ratio. Take for the given ratio  $2 : 3$ .

9. What are the expressions for the circumference and area of a circle in terms of  $\pi$  and the radius?

#### IV.

1. Define a Plane, a Plane Figure, a Parallelogram.

2. Prove that, if in a triangle two angles are equal, the opposite sides are also equal and the triangle is isosceles.

3. What is the measure of an inscribed angle?

4. Upon a given straight line to construct a segment such that any angle inscribed in it shall have a given magnitude.

5. To find a fourth proportional to three given lines.

6. Define Similar Polygons. Draw two polygons mutually equiangular, but not similar; also two polygons having proportional sides, but not similar. In what cases are triangles similar.

7. Prove that any two parallelograms of the same base and altitude are equivalent.

8. Prove: (a.) That similar triangles are to each other as the squares of their homologous sides. (b.) Prove that of similar polygons.

#### V.

1. Prove that the perpendicular from the centre of a circle upon a chord bisects the chord and the arc subtended by the chord.

2. To circumscribe a circle about a given triangle.
3. Prove that two angles are to each other in the ratio of two arcs described from their vertices as centres with equal radii.
4. Prove that a line drawn through two sides of a triangle parallel to the third side divides those two sides into proportional parts.
5. State and prove the proportion which exists between the parts of two chords which cut each other in a circle. State what proportion exists when two secants are drawn from a point without the circle.
6. Prove that two regular polygons of the same number of sides are similar.
7. Prove that similar triangles are to each other as the squares of their homologous sides.
8. Show how the area of a polygon circumscribed about a circle may be found; then how the area of a circle may be found; then prove that circles are to each other as the squares of their radii.

## VI.

1. Prove that if two opposite sides of a quadrilateral are equal and parallel, the other two sides are also equal and parallel.
2. To describe a circle of which the circumference shall pass through three given points not in a straight line.
3. To find a third proportional to three given lines by a geometrical construction.
4. Prove that a perpendicular dropped in a right triangle from the vertex of the right angle to the hypotenuse divides the triangle into two triangles which are similar to each other and to the whole triangle.

5. To find a mean proportional between two given lines.

6. To circumscribe about a circle a regular polygon similar to a given inscribed regular polygon.

7. Similar polygons are to each other as the squares of their homologous sides. What is the ratio between the areas of two circles?

8. Prove that the area of a circle of which  $r$  is the radius is equal to  $\pi r^2$ .

## VII.

1. Prove that if two triangles have two sides of the one respectively equal to two sides of the other, while the included angles are unequal, the third sides will be unequal, and the greater third side will belong to that triangle which has the greater included angle.

2. Prove that the greater of two chords in a circle is subtended by the greater arc; and the converse.

3. Find the common measure of these two lines, and express their ratio in numbers:

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4. To divide one side of a triangle into two parts proportional to the other two sides. (Solve and prove.)

5. The perimeters of similar polygons are to each other in what ratio? (State and prove.)

6. To circumscribe a circle about a given regular polygon. (Solve and prove.)

7. Prove that the line which joins the middle points of the two sides of a trapezoid which are not parallel is parallel to the two parallel sides and equal to half their sum. What is the area of a trapezoid?

8. To construct a parallelogram equivalent to a given square and having the sum of its base and altitude equal to a given line. (Solve and prove.)

### VIII.

1. Prove that only one perpendicular can be drawn from a point to a straight line.

2. Prove that of two sides of a triangle that is the greater which is opposite the greater angle. State and prove the converse.

3. Through a given point to draw a tangent to a given circle.

4. Prove that if a line be drawn so as to divide two sides of a triangle into proportional parts, this line is parallel to the third side.

5. To inscribe in a circle a regular decagon.

6. Prove that a triangle is equivalent to half of any parallelogram of the same base and altitude.

7. To find a triangle equivalent to a given polygon.

8. To construct a parallelogram equivalent to a given square, and having the difference of its base and altitude equal to a given line.

### IX.

1. Prove that when oblique lines are drawn from a point in a perpendicular to points unequally distant from the foot of the perpendicular, the more remote line is the longer.

2. To bisect a given angle.

3. Draw a number of lines radiating from a point, and

then draw two parallel lines intersecting them : prove that the parts of these parallels are proportional.

4. A tangent and a secant being drawn from a point outside a circle, prove that the tangent is a mean proportional between the entire secant and its exterior part.

5. What is the centre of a regular polygon ? Prove that the sides of a regular polygon are equally distant from the centre.

6. The circumference of a circle is 341.8 feet ; what is the circumference of another circle having twice the area of the former ? (If you have not time to perform the computation, you can explain how to do it.)

## X.

1. In what three cases is it proved that two triangles are equal ? In what three cases, that they are similar ? Define similar polygons.

2. Prove that if two opposite sides of a quadrilateral are equal and parallel, the other two sides are also equal and parallel. Define a Trapezoid.

3. Prove that if two polygons are composed of the same number of triangles which are respectively similar and similarly disposed, the polygons are similar.

4. State and prove the theorem concerning the ratio between the areas of two similar triangles.

5. Prove that two regular polygons of the same number of sides are similar.

6. Find the formula for the area of a circle in terms of the radius and the ratio of the circumference to the diameter.

## XI.

1. To how many right angles is the sum of all the interior angles of any polygon equal? State and prove; and then state and draw the figure for the theorem on which this one immediately depends.

2. What is the measure of the angle formed by two chords which cut each other between the centre and the circumference? by two chords which meet at the circumference? by two secants which meet without the circumference? Draw the figure for each case, and prove the last one.

3. To describe a circle through three given points.

4. Prove that two regular polygons of the same number of sides are similar.

5. The area of a trapezoid is half the product of its altitude by the sum of its parallel sides.

6. The perimeter of a regular hexagon is 18. Find

(a.) The area of the circumscribed circle;

(b.) The area of the square inscribed in this circle.

7. Prove the proportion that exists between the parts of two intersecting chords.

## XII.

1. Two parallel lines are cut by a third line. Prove what angles formed by these lines are equal, and also what angles are supplements of each other.

2. Obtain the value of any interior angle of a regular octagon.

3. An angle inscribed in a circle is measured by half the arc intercepted by its sides. Prove this proposition for each of the three cases which may arise.



4. State and prove the method of finding the centre of a given circle or arc.

5. State and prove the method of finding a mean proportional between two given straight lines.

6. From a point without a circle secants are drawn to the circle. Prove the proportion existing between the entire secants and the parts lying outside the circle.

What corollary results when one of these secant lines becomes a tangent.

7. Show how a square may be constructed equal in area to any given polygon.

## SOLID GEOMETRY.

## COURSE II.

## I.

1. PROVE that two parallel lines are always in the same plane.

2. Prove that the sum of the plane angles, which form a solid angle, is always less than four right angles. (This theorem is sometimes stated thus: The sum of the face angles of a polyhedral angle is less than four right angles.)

3. Prove that parallel sections of a pyramid are similar polygons. What proposition relating to the volumes of pyramids is proved by aid of this proposition? (State, but do not prove.)

4. Prove that the sum of the angles of a spherical triangle is greater than two right angles.

5. A spherical triangle has angles of  $75^\circ$ ,  $94^\circ$ , and  $91^\circ$ ; what is its area in degrees? How large a portion of the surface of the sphere does it cover?

6. The surface of a sphere is 31.17 square feet; what is the surface of another sphere having three times the volume of the former?

## II.

1. Define a Plane, a Prism, a Great Circle. How many faces has a parallelopiped? How many edges? How is the angle between two planes measured?

2. Prove that if two planes are perpendicular to a third plane, their line of intersection is also perpendicular to the third plane.

3. Prove that the section of a pyramid made by a plane parallel to the base is a polygon similar to the base.

4. Prove that a triangular pyramid is a third part of a triangular prism of the same base and altitude.

5. Prove that the sum of the angles of a spherical triangle is greater than two right angles.

6. Given the radius of a sphere = 2 inches. Compute the volume and convex surface.

### III.

1. If two planes are perpendicular to each other, the line drawn in one plane perpendicular to the common intersection is also perpendicular to the second plane.

2. The sum of all the plane angles which form a solid angle is always less than four right angles.

3. The solidity of a triangular prism is the product of its base by its altitude. Prove; and then show briefly how this theorem is made use of in finding the volume of a cylinder. Give the formula to express that volume.

4. Define similar polyhedrons. Prove that similar prisms, or pyramids, are to each other as the cubes of their altitudes.

5. Prove that if two spherical triangles on the same sphere, or on equal spheres, are equilateral with respect to each other, they are also equiangular with respect to each other.

6. The length of a perfectly round log of wood is 20 feet, and the diameter of each end is 12 feet. Find: (a.) Its convex surface. (b.) The surface of the greatest sphere which can be cut out of it. (c.) The volume of this sphere.

# LOGARITHMS AND TRIGONOMETRY.

## I.

1. Find the value of the following fraction by logarithms:

$$\left( \frac{0.010006}{1.4 \times \sqrt[3]{0.325062}} \right)^3.$$

2. Find the value of the following fraction by logarithms:

$$\left( \frac{(0.050395)^2}{3.2 \times \sqrt[3]{0.546781}} \right).$$

3. Find the value of the following fraction by logarithms, using arithmetical complements:  $\left( \frac{0.00101904 \times 0.99992}{760 \times \sqrt[3]{(0.0275142)}} \right)^4.$

4. Define a logarithm.

5. Find, by logarithms, the value of the following quantities to six significant figures:  $\sqrt[3]{0.0117283}$ ;  $(0.50396)^2$ ;  $\left( \frac{1}{0.50396} \right)^2$ ;  $\frac{\sqrt[3]{0.0117283}}{2.4 \times (0.50396)^2}$ : use arithmetical complements in dividing.

6. Solve the equation  $32^x = 8$  by logarithms.

7. Prove that the sum of the logarithms of several numbers is equal to the logarithm of their product.

8. Find, by logarithms, the values of the following quantities to six significant figures:  $\sqrt[3]{(0.62394)}$ ;  $(0.00102173)^2$ ;  $\sqrt[3]{\frac{1}{0.62394}}$ ;  $\frac{(0.0012173)^2}{3.1 \times \sqrt[3]{(0.62394)}}.$

## II.

1. In a system of which the base is 9, what is the logarithm of  $81$ ? of  $3$ ? of  $27$ ? of  $9$ ? of  $1$ ? of  $\frac{1}{9}$ ? of  $\frac{1}{81}$ ? of  $0$ ?

2. Find, by common logarithms, the values of the following quantities (to five significant figures):  $\sqrt[3]{(0.492162)}$ ;  $(0.011009)^6$ ;  $\frac{1}{(0.011009)^6}$ ;  $\frac{\sqrt[3]{(0.492162)}}{9.8 \times (0.011009)^6}$ . Use arithmetical complements in dividing.

3. Solve the equation  $2048^x = 16$ , by logarithms.

4. Express in a decimal form the numbers which have the following logarithms in a system of which the base is  $16:2$ ;  $-2$ ;  $-0.25$ ;  $2.75$ ;  $0$ .

5. Find, by common logarithms, the values of the following quantities (to five significant figures):  $\sqrt[3]{(0.485463)}$ ;  $(0.00130106)^2$ ;  $\frac{1}{(0.00130106)^2}$ ;  $\frac{\sqrt[3]{(0.485463)}}{2.7 \times (0.00130106)^2}$ . Use arithmetical complements in dividing.

6. Prove that the logarithm of the product of two numbers is equal to the sum of the logarithms of the numbers.

7. Find, by logarithms, the values of the following quantities (to six significant figures):  $\sqrt[3]{(0.0126534)}$ ;  $\left(\frac{1}{0.56036}\right)^{\frac{1}{2}}$ ;  $\frac{\sqrt[3]{(0.0126534)}}{.204 \times (0.56036)^2}$ . Use arithmetical complements in dividing.

8. Solve the equation  $243^x = 81$  by logarithms.

9. What is the characteristic of a logarithm?

10. What is the logarithm of 1.? of .1? of 1000.? of .00001? of one hundred billionth?

11. Find, by logarithms, the value of the following quantities (to six significant figures):  $\left(\frac{1}{.0126534}\right)^{\frac{1}{2}}$ ;  $\frac{\sqrt{(0.0357635)}}{(\sqrt{2.04} + \sqrt{1.2036})^2}$ .

12. Solve the equation  $1024^x = 64$ .

## III.

1. Prove that the logarithm of a quotient is equal to the logarithm of the dividend diminished by the logarithm of the divisor.

2. Find, by logarithms, the values of the following quantities:  $\sqrt[3]{0.03478}, \frac{(0.278)^2 \times (0.008)^{\frac{1}{2}}}{0.03478 \times (0.7)^2}$ .

3. Prove the formula  $(\sin A)^2 + (\cos A)^2 = 1$ . What is the formula for the cosine of the sum of two angles?

4. Solve the oblique triangle in which  $a = 50, A = 45^\circ, B = 60^\circ$ . N. B. —  $a, b, c$  denote the sides;  $A, B, C$  the angles respectively opposite to  $a, b, c$ .

5. In a system of logarithms, of which 4 is the base, determine the logarithms of the following numbers: 4; 16; 2; 8; 32; 1;  $\frac{1}{2} = 0.5$ ;  $\frac{1}{4} = 0.25$ ;  $\frac{1}{8} = 0.125$ ;  $\frac{1}{16} = 0.0625$ ; 0. What is the base of the common system of logarithms?

6. Find, by logarithms, using arithmetical complements, the values of the expressions:  $(0.001109)^2$ ;  $\frac{1}{(0.001109)^2}$ ;

$$\sqrt[3]{\frac{\sqrt{(0.492)} \times 560}{9 \times (0.001109)^2}}$$

7. What single function of any angle  $A = \frac{\sec A}{\tan A}$ ? What function is the reciprocal of the secant.

8. Give the formulas for the sine and cosine of the sum and of the difference of two angles; and deduce from these the formulas for the sine and cosine of the double of an angle and of the half of an angle.

9. What is the sine and cosine of  $0^\circ, 90^\circ, 180^\circ, 270^\circ, 360^\circ$ . Work out the formulas for the trigonometric functions of  $(270^\circ - N)$ .

10. Solve the triangle in which  $b = 0.007625$ ,  $c = 0.015$ ,  $B = 29^\circ$ . Find both solutions. N. B. —  $A, B, C$  denote the angles respectively opposite the sides  $a, b, c$ .

## IV.

1. What is the logarithm of 1 in any system? of any number in a system of which that number is the base? In a system of which the base is 4, what is the logarithm of 64? of 2? of 8? of  $\frac{1}{2}$ ?

2. Find by logarithms, using arithmetical complements, the value of the fraction  $\frac{(0.02183)^3 \times (7)^{\frac{1}{2}}}{\sqrt{(0.0046)} \times 23.309}$ .

3. Prove the formula for the cosine of the sum of two angles; and deduce the formulas for the cosine of the double of an angle and the cosine of the half of an angle.

4. In what quadrants is the cosine positive, and in what quadrant is it negative? Prove the values of the cosine of  $0^\circ, 90^\circ, 180^\circ, 270^\circ$ .

5. Given in an oblique triangle  $b = 0.254$ ,  $c = 0.317$ ,  $B = 46^\circ$ . Solve completely.

## V.

1. Prove that the logarithm of the product of several factors is equal to the sum of the logarithms of the factors.

2. Prove that the logarithm of the  $n$ th root of a number is  $\frac{1}{n}$ th of the logarithm of the number.

3. Work the following examples:  $0.01706 \times 8.7634 \times 0.001 = ?$ ;  $\frac{1}{0.01706} = ?$ ;  $\sqrt{4.9} = ?$ ;  $\sqrt[3]{0.29} = ?$ ;

$\frac{\sqrt{(8.7634)^3} \times 100}{9 \times \sqrt{0.1109} \times (4.9)}$ ? Use arithmetical complements in working the last.

4. Which of the trigonometric functions are always less than unity? which always greater? which sometimes greater and sometimes less?

5. Write down the formulas for the sine and cosine of the sum, and the sine and cosine of the difference of two angles.

6. Prove the formula  $\sin^2 a + \cos^2 a = 1$ .

7. From the formulas of the two preceding questions deduce formulas for the sine, cosine, and tangent of twice an angle, and of half an angle.

8. To solve a triangle in which two sides and an angle opposite one of them are given. Example: one side = 47.6, another side = 32.9, and the angle opposite the latter side =  $53^\circ 24'$ .

## VI.

1. Prove that the logarithm of the product of several factors is equal to the sum of the logarithms of the factors.

2. Work the following examples: (a.)  $0.01706 \times 8.7634 \times 0.001 = ?$  (b.)  $\frac{1}{0.01706} = ?$  (c.)  $\sqrt{4.9} = ?$   $\sqrt[3]{0.29} = ?$  (d.)  $\sqrt[5]{\frac{(8.7634)^3 \times 100}{9 \times \sqrt{0.1109} \times (4.9)^{\frac{1}{2}}}} = ?$  Use arithmetical complements in working the last.

3. Find the sines, cosines, and tangents, both natural and logarithmic, of the following angles: (A.)  $24^\circ 47' 22''$ . (B.)  $56^\circ 23' 14''$ . (C.)  $134^\circ 28'$ . Find the angles which correspond to the following functions:  $\log \sin A = 9.94325$ .  $\text{nat} \cos B = -0.57832$ .  $\text{nat} \tan C = 1.473$ .

4. Prove the formula  $a^2 = b^2 + c^2 - 2bc \cos A$ .

5. Prove the formulas  $1 + \cos A = 2 (\cos \frac{1}{2} A)^2$ .  $1 - \cos A = 2 (\sin \frac{1}{2} A)^2$ .



6. From the formulas of the last two questions deduce the formula  $\sin \frac{1}{2} A = \sqrt{\frac{(s-b)(s-c)}{bc}}$ .

7. The sides of a triangle are 37, 41, and 48; what are the angles?

8. To solve a triangle when two sides and the included angle are given. *Example*: Given the sides 47.6 and 58.4, the included angle  $52^{\circ} 24'$ .

## VII.

1. In a system of logarithms of which the base is 16, what is the number of which the logarithm is  $-1.25$ ? In the system of which 10 is the base, why do the logarithms of two numbers composed of the same series of significant figures differ only in their characteristics?

2. Prove that the logarithm of the continued product of several numbers is equal to the sum of their logarithms.

3. Write (without proving) the formulas for the sine and cosine of the sum and of the difference of two angles; and prove the formula  $\cos A + \cos B = 2 \cos \frac{1}{2}(A+B) \cos \frac{1}{2}(A-B)$ .

4. Give the values of the sine, cosine, and tangent of  $0^{\circ}$ ,  $90^{\circ}$ ,  $180^{\circ}$ ,  $270^{\circ}$ ,  $360^{\circ}$ . Find the formula for  $\cos(270^{\circ} - \varphi)$ .

5. Given in a triangle  $b = 0.1072$ ,  $c = 0.0625$ ,  $C = 20^{\circ} 17'$ . Solve completely.

6. Find by logarithms the value of  $\frac{\sqrt[3]{(0.07323)^2}}{0.35308 \times 3700}$ .

7. Given the cotangent of an angle equal to  $2\sqrt{2}$ ; find the other trigonometric functions, by computation.

## VIII

1. What is the reason that, in the common system, the logarithms of two numbers consisting of the same series of significant figures differ only in their characteristics ?

2. Write (without proving) the formulas for the sine and cosine of the sum and of the difference of two angles ; and deduce those for the sine and cosine of the double of an angle and of the half of an angle.

3. Find, by means of formulas, the trigonometric functions of  $30^\circ$  and  $60^\circ$ .

4. Prove that, in any triangle,  $\frac{a+b}{a-b} = \frac{\tan \frac{1}{2}(A+B)}{\tan \frac{1}{2}(A-B)}$ .

5. Solve the triangle in which  $a = 110.6$ ,  $b = 56.7$ ,  $C = 108^\circ 24'$ .

6. Find, by logarithms, the value of the fraction  $\frac{\sqrt[4]{(0.027919)^3}}{(0.0010708)^3 \times 7.9}$ .

## IX.

1. Obtain a formula by which, when the sine of an angle is known, its cosine may be found. Also formulas for finding the tangent and cotangent of an angle, when the sine and cosine are given.

2. Obtain, by the formulas of the previous question, the trigonometric functions of  $45^\circ$ .

3. Prove that, in any triangle, the sines of any two angles are proportional to the opposite sides.

4. Solve the triangle in which two sides are 32.64 and 25.14, and the angle opposite the second side is  $32^\circ 48'$ . Are there two solutions to this problem ? Why ?

5. Find, by logarithms, the value of  $\sqrt[4]{\frac{32.85 \times (.0146)^3}{(23.9)^3}}$ .

6. State the process and give the formulas by which, when two sides and the included angle of a triangle are known, the remaining parts can be obtained.

### X.

1. In the system of logarithms with six for its base, of what numbers will 3 and  $-3$  be the logarithms? What will be the index of the logarithm of 2000?

2. Find, by logarithms, the value of  $\frac{4}{7} \sqrt[3]{\frac{84.9 \times .001}{(.4286)^2}}$ .

3. Show, by means of a diagram, what lines may be taken to represent the sine and the cosine of angles in each of the four quadrants of a circle, the radius of the circle being unity. Show also what are the algebraic signs of these same functions in the different quadrants.

4. Obtain formulas for the trigonometric functions of a negative angle.

5. In a right plane triangle, one side is 0.1426 and the opposite angle is  $47^\circ 29'$ . Solve the triangle.

6. Write the formulas for the sine and the cosine of the sum of any two angles; and obtain from them formulas for the sine and the cosine of the double angle. The sine of a certain angle is  $\frac{7}{25}$ . Find the trigonometric functions of double that angle.

7. Two sides of a plane oblique triangle are 16.49 and 21.37, and the included angle is  $129^\circ 37'$ . Find the other two angles. State the method of finding the remaining side.

8. One angle of a plane triangle is  $30^\circ$ , and an adjacent side is 12. What values of the side opposite the given angle will give two solutions to the triangle? What values will give only one? What values will give no solution?

## PHYSICS.

## COURSE II.

## I.

1. DEFINE the terms Force, Weight, Mass.
2. If two forces acting perpendicularly on a straight lever in opposite directions and on the same side of the fulcrum balance each other, they are inversely as their distances from the fulcrum ; and the pressure on the fulcrum is equal to the difference of the forces.
3. The pressure upon any particle of a fluid of uniform density is proportional to its depth below the surface of the fluid.
4. In 50 cubic yards of rock, whose average specific gravity is 142, there enter 32 cubic yards of a substance whose specific gravity is 124. Find the specific gravity of the remainder of the rock.
5. How would you graduate a hydrometer for ascertaining the strength of alcohol.
6. How do you change from Fahrenheit to Centigrade ?

## II.

1. How does the weight of a body differ from the mass ? How are forces represented ? If it be stated that two forces of 5 lbs. and 10 lbs. act upon a body, what more is wanting to enable us to determine the result ?
2. Prove the proposition, " If two forces, acting at any angles on the arm of any lever, balance each other, they are

inversely as the perpendiculars drawn from the fulcrum to the directions in which the forces act."

3. The direction of two forces, P and Q, which act on a bent lever and keep it at rest, make equal angles with the arms of the lever, which are at 6 and 8 inches respectively. Find the ratio of Q to P.

4. Find the centre of gravity of a triangle. One half of a given triangle is cut off by a straight line parallel to the base: find the centre of gravity of the remaining trapezium.

5. Prove the proposition, "When a body of uniform density floats on a fluid, the part immersed: the whole body :: the specific gravity of the body: the specific gravity of the fluid."

6. If the difference of readings of a thermometer, which is graduated both according to Fahrenheit's and the Centigrade scale, be 40, find the temperature in each scale.

## MECHANICS.

## COURSE II.

## I.

1. PROVE the law of the parallelogram of forces.
2. Find the centre of gravity of any number of heavy points.
3. Deduce the law of the equilibrium of movable pulleys, taking the weight of the pulleys into account.
4. Find the relation of  $P$ 's velocity to that of  $W$  on an inclined plane.
5. Prove the equality of fluid pressures. Explain the Hydrostatic Paradox.
6. If the volume of the receiver of a condensing pump is five times that of the barrel, find the pressure on the valve after ten strokes.

## II.

1. Define Force ; Weight ; Mass ; and Density. How are forces represented ?
2. Give the axioms of the lever. Assuming the properties of the straight lever, prove the laws of the bent lever.
3. Can the resultant of two forces, in any case, be equal to one of the components ? If so, what are the conditions ?
4. A string passing round a smooth peg is pulled at each end by a force equal to the strain upon the peg. Find the angle between the two parts of the string.

5. Deduce the laws of the inclined plane, both when the body on the plane is at rest, and when it is in motion.

6. Prove that when a body of uniform density floats on a fluid, the part immersed : the whole body : : the specific gravity of the body : the specific gravity of the fluid.

7. Prove that the elastic force of air at a given temperature varies as the density. A barometer is sunk to the depth of twenty feet in a lake, find the consequent rise in the mercurial column. (Specific gravity of mercury = 13.57.)

# Announcements.

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In answer to an inquiry by Mr. Greenough, Mr. Whitney says:—

I do not understand how any one should have the assurance to maintain that comparative philology is losing ground as regards the recognition of its bearing on Greek and Latin Grammar. So much as this may be true, that the prominent introduction of matters of comparative philology into special grammars, of which some over-zealous persons were guilty at the outset, has been seen to be ill-judged, and is not continued. But your grammar does not err at all on that side; as I wrote you once before, I especially admire and approve the way in which you have utilized the results of comparative grammar, without thrusting them unduly upon the attention of the pupil. Comparative grammar is simply the investigation of the history and causes of existing forms; and that it has won most solid and valuable results no well-informed person, if unprejudiced, will think of denying. And any one who writes nowadays a classical grammar without making himself familiar with what comparative philology has done and learned, plainly omits, in my opinion, one great part of his preparation for the task he has undertaken.

*From* PROFESSOR THOMAS A. THACHER, *Yale College.*

I like the Grammar very much, and hope that it will be widely used.

*From* W. C. COLLAR, *Latin School, Roxbury, Mass.*

I have looked through your Latin Grammar, examining parts of it with a good deal of care, and my opinion of its merits is so decided that I shall substitute it at once for the work which I have been using with my classes for several years.

I am especially pleased with the hints on comparative grammar, and with

the treatment of the subjunctive mood. I think that the former will prove suggestive and helpful to many teachers in their private studies, while the latter will make it possible now to render the most difficult subject of Latin grammar intelligible to advanced classes in preparation for college.

*From H. H. SANFORD, Professor of Latin, Syracuse University, N. Y.*

Having given the Latin Grammar of Allen & Greenough a careful examination and comparison with other manuals now in use, I have decided to introduce it in the University as the most convenient and complete handbook for the student to use in preparing his lessons.

*From JAMES M. TAYLOR, Principal of Grammar School, Hamilton, N. Y.*

The examination of Allen & Greenough's Latin Grammar has given me great pleasure. The work cannot fail to awaken new interest and enthusiasm in the study of Latin, and greatly to promote the scientific study of language. A correct and yet similar treatment of the Subjunctive Mood in both Greek and Latin, such as is found in Goodwin's Greek and Allen & Greenough's Latin Grammars, must in no small degree facilitate the student's progress, and increase his interest in both languages. The merits of the Grammar are so decided, that we shall introduce it at once in our school. The publishers' beautiful text-books, both Latin and Greek, show that they understand the art of book-making.

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*From ROBERT EDWARD BABSON, Master Boston English High School.*

I have examined with considerable care the Latin text-books you have recently published, with a view to selecting the best books for the use of the advanced class in our school. I have no hesitation in recommending them in preference to any others with which I am acquainted. The arrangement of topics in the grammar is admirable, the rules are elegantly and clearly



expressed, while the notes contain the most valuable results of the more recent investigations in comparative grammar. The practical value of a text-book for class work depends greatly upon the clearness with which the relative importance of topics is suggested to the learner, and the precision and completeness with which the main rules are expressed. In these respects I believe your Grammar to be superior to that of Andrews & Stoddard or of Harkness.

From PROFESSOR W. W. GOODWIN.

MY DEAR GREENOUGH:—

I am met on my return from Europe by your note asking whether Comparative Philology as a basis for Greek and Latin Grammar is losing ground in Germany. I thought at first that your question was a joke which you were playing off on a new-comer; and I am still at a loss to know who can have started such a question in earnest.

I cannot speak from the experience of my recent journey, on which I have seen very little of the German *Gelehrte*; but I can say from my general knowledge (or ignorance) that if there is any such tendency as that of which you speak, the fact has escaped my observation. On the contrary, it seems to me that the claims of comparative philology were never so fully recognized by classical scholars as they now are, and that there is less *talk* about them, simply because they are no longer seriously disputed.

There may have been a wholesome influence exercised by conservative scholars against a few enthusiasts who would reduce classic philology to a mere branch of comparative philology. On this point I think the best scholars in both departments are substantially agreed; and the disposition to overwhelm beginners in Latin and Greek with a blinding storm of Sanskrit, Zend, and Slavic surely never has received encouragement from the best comparative philologists. But the idea that any real scholars, who profess to represent modern "scientific" scholarship, can object to the introduction of comparative grammar as far as you and Mr. Allen have used it in your new Latin Grammar, seems to me too preposterous to be seriously discussed. Classical philology, like every other science that expects to maintain its position in the nineteenth century, must stand on a scientific basis, and comparative philology supplies the only such basis on which an important part of Latin and Greek Grammar can rest. To reject this basis, and to attempt to build on other foundations which are known to be untrustworthy, is to expose the whole study to merited contempt. It seems to me that you have acted on the same general principle which I followed in preparing my small Greek Grammar,—that of accepting the results of comparative philology where they came within the plan of the work, but of omitting all detail which would merely perplex beginners without aiding them in understanding fundamental principles. As your work is a larger one than mine, and is made on a more comprehensive plan (adapted

to the greater length of time during which boys study Latin at school), you have of course introduced more detail on this and every other subject than was consistent with my plan.

But, whatever difference of opinion there might be about the proper amount of comparative philology for any particular book, I cannot conceive how any scholar can seriously believe that you have taken a course which is opposed to the tendency of modern scholarship. Hoping your work will have success in full proportion to its great merits, I remain,

Yours very truly,

W. W. GOODWIN.

HARVARD COLLEGE, October 7, 1872.

*From O. HOWES, Shurtleff College, Upper Alton, Ill.*

I find Leighton's Latin Lessons, which you did me the favor to send me, what it should be in order to be a suitable companion-book to the admirable grammar of Allen & Greenough. It seems to me to be prepared with care and good judgment, and to constitute, in connection with the grammar, just the apparatus needed to introduce the student properly to the reading of Latin.

*From HENRY S. DANA, Vermont.*

A further examination of Allen & Greenough's Latin Grammar gives me a still more favorable opinion of the work. The syntax, especially, so far as I have looked it over, assures me that great pains have been bestowed upon the work to make it thorough, comprehensive, and useful. The grammar seems well adapted for the class-room, where always the severest test is found for works of this kind. I could recommend it with confidence that upon trial it will prove an excellent manual for the student of the Latin language.

*From M. KELLOGG, Professor of Latin in University of California.*

I thank you for the copy of Allen & Greenough's Latin Grammar which you recently sent me. I like it very much, and have already recommended it to teachers in High Schools and Academies. It will be put in our next catalogue on an equal footing with the one heretofore used. As soon as the whole series is well established, I doubt not it will stand pre-eminent.

*From S. BURNHAM, Newton Centre, Mass.*

After a careful examination of Allen & Greenough's Latin Grammar, I am convinced that, for comprehensiveness, clearness, and conciseness in its statements, and especially in its rules, and conformity to the present state of philological science, it is the best text-book for schools and colleges we have published in its department in America, so far at least as I am aware.

*From PROFESSOR J. B. FOSTER, Colby University.*

Allow me to add that, on examination, I am much pleased with the work, and think it must commend itself to the high consideration of teachers. While much condensed in matter and statement, and brief in illustration, its exhibition of the forms and principles of the language is very complete, and its method felicitous. A thorough knowledge of its contents would be regarded as ample qualification, in this department, for admission to the institution.

*From PROF. M. W. HUMPHREYS, Washington and Lee College, Lexington, Virginia.*

I am pleased to see appearing in this country so scientific and so able a work as Allen & Greenough's Latin Grammar. It is, in my opinion, just the book demanded to meet the wants of American students who would keep pace with the progress now being made in the science of language.

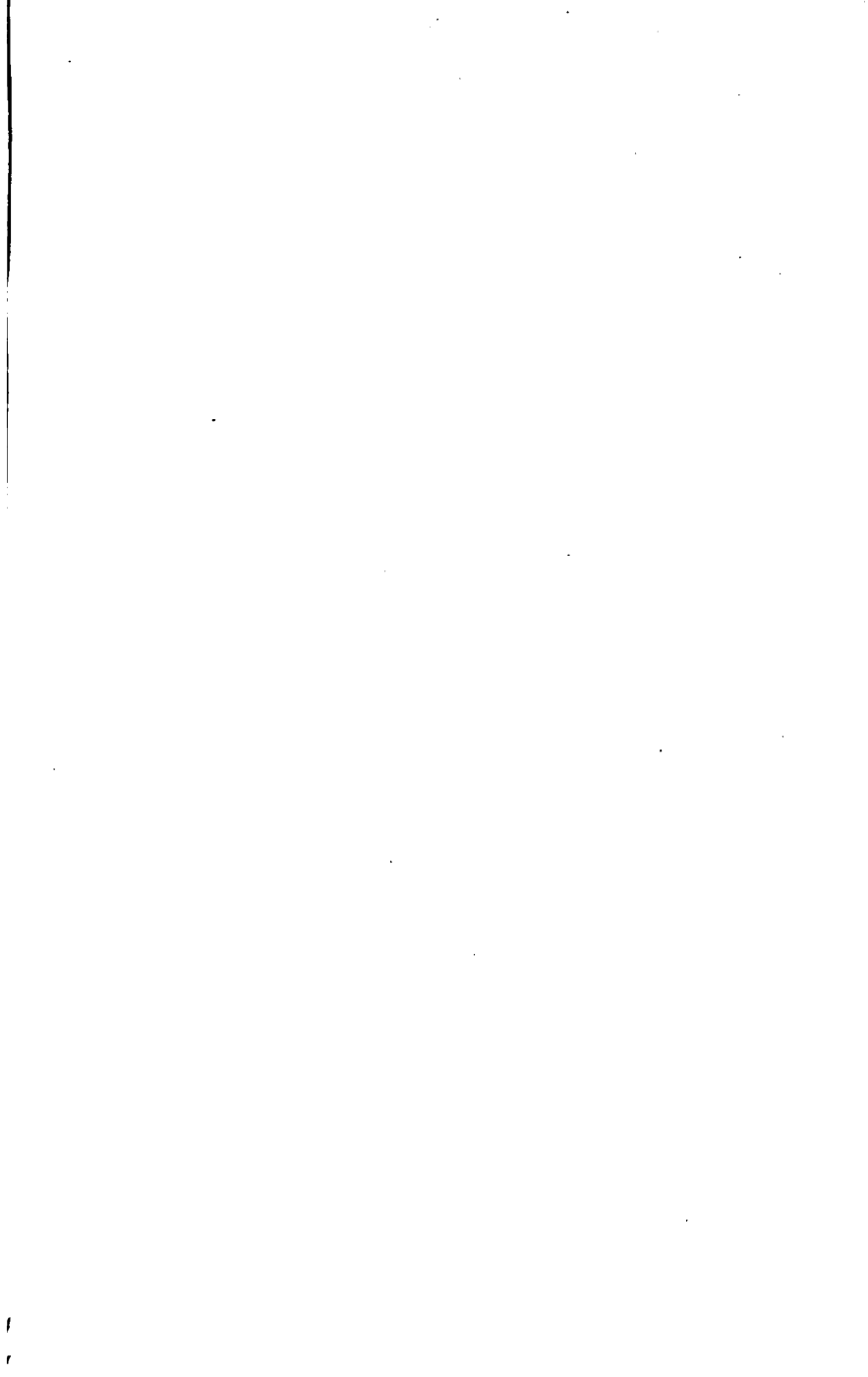
*From TRACY PECK, Professor of Latin, Cornell University.*

The new grammar impresses me very favorably in two important particulars, — in the brevity (secured without sacrifice of clearness) in the statement of the facts and rules of the language, and in the intelligent effort to base the peculiarities of Latin upon the broader principles of linguistic science.

The first point is its recommendation for younger classes, while by the second I feel that advanced scholars will be enlightened and quickened. I cordially trust that the Grammar will have that wide acceptance to which its merits appear to me to entitle it.

*From H. W. HAYNES, University of Vermont, Burlington.*

As careful an examination of Messrs. Allen & Greenough's Latin Grammar as my engagements have allowed me to make has confirmed the opinion formed upon a more cursory examination, that it is one of the most valuable contributions to classical learning this country has produced. I am astonished at the amount and variety of information condensed into such brief space. At first I was fearful that the attempt to apply the scientific methods of comparative philology to an elementary book might make it too abstruse for beginners, though it might furnish a most useful manual for more advanced students. But on examination it does not appear to me more difficult of comprehension than the former school grammars, while in the hands of a skilful teacher it will do much more than impart merely the elements of the Latin language to the youngest students. I rejoice to see the study of Latin at last in the process of being raised to its true position among the sciences, and I congratulate the editors most sincerely upon their success.







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